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(54) **SYSTEMS AND METHODS FOR TISSUE REMOVAL**

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A61B 17/02 (2006.01)
A61B 17/34 (2006.01)
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CPC ***A61B 17/02*** (2013.01); ***A61B 17/00234*** (2013.01); ***A61B 17/32002*** (2013.01);
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(58) **Field of Classification Search**
CPC A61B 17/00234; A61B 17/02; A61B 17/0206; A61B 17/0225; A61B 17/0218;
(Continued)

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Primary Examiner — Victoria Hicks Fisher
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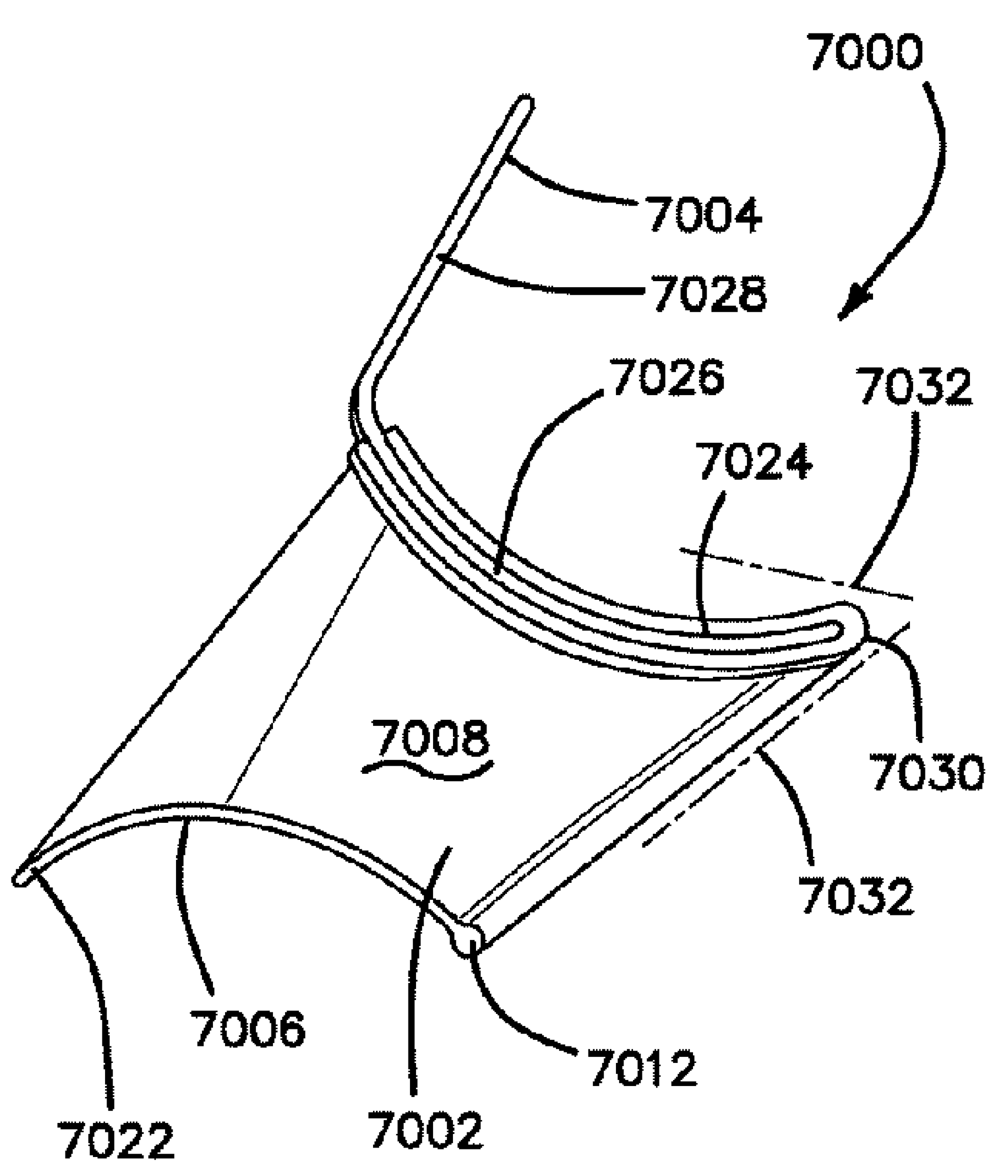
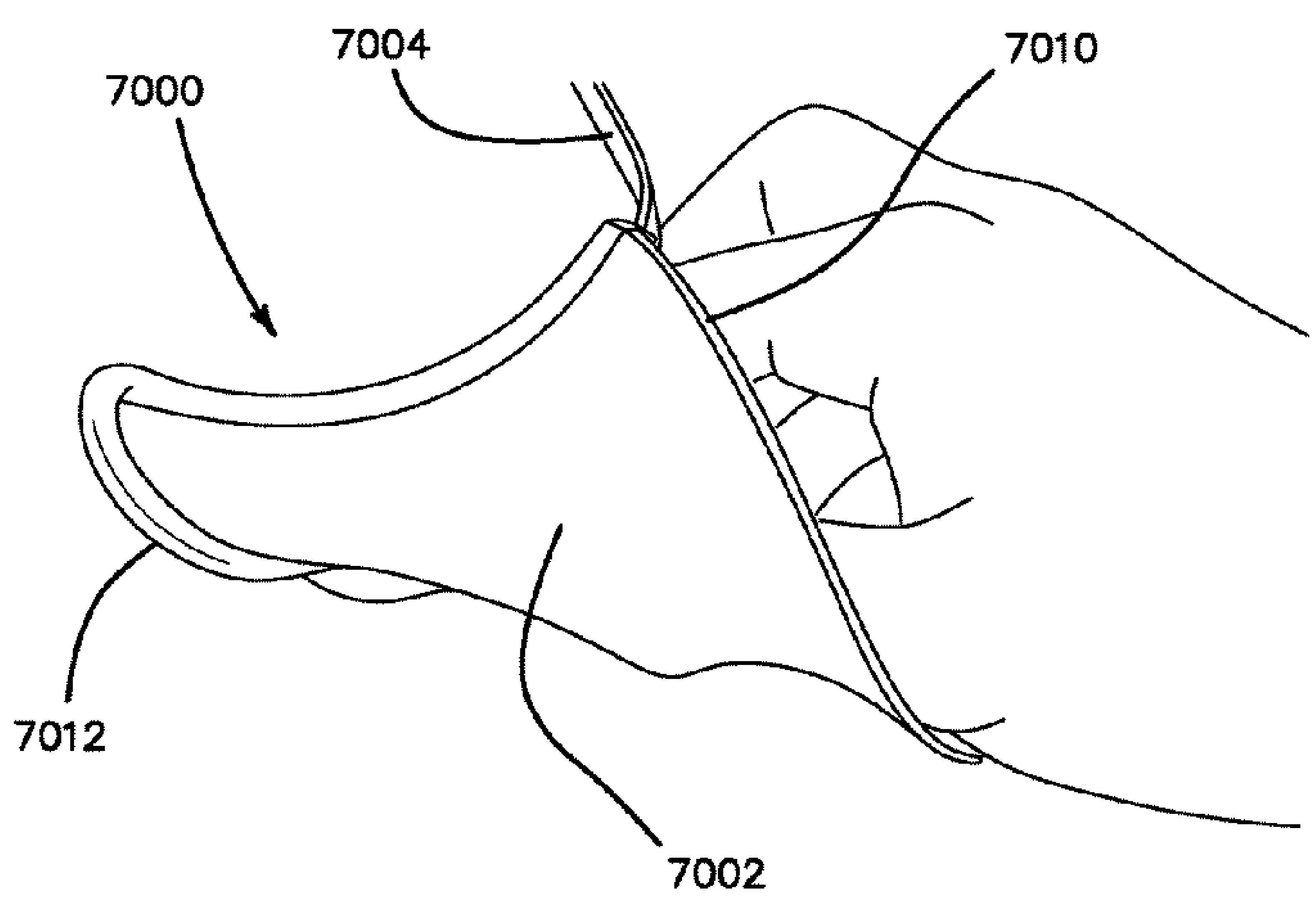
(57) **ABSTRACT**

Systems and methods for preventing the seeding of cancerous cells during morcellation of a tissue specimen inside a patient's body and removal of the tissue specimen from inside the patient through a minimally-invasive body opening to outside the patient are provided. One system includes a cut-resistant tissue guard removably insertable into a containment bag. The tissue specimen is isolated and contained within the containment bag while the cut-resistant tissue guard protects the containment bag and surrounding tissue from incidental contact with sharp instrumentation used during morcellation and extraction of the tissue specimen. The cut-resistant tissue guard is adjustable for easy insertion and removal such that it securely anchors to the body opening. Protection-focused and containment-based systems for tissue removal are provided that enable minimally invasive procedures to be performed safely and efficiently.

20 Claims, 103 Drawing Sheets





Related U.S. Application Data

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(51) **Int. Cl.**
A61B 17/00 (2006.01)
A61B 17/32 (2006.01)
A61B 17/3211 (2006.01)
A61B 90/00 (2016.01)
A61B 90/40 (2016.01)

(52) **U.S. Cl.**
CPC ***A61B 17/3211*** (2013.01); ***A61B 17/3417*** (2013.01); ***A61B 17/3423*** (2013.01); *A61B 17/0293* (2013.01); *A61B 17/3431* (2013.01); *A61B 17/3439* (2013.01); *A61B 90/40* (2016.02); *A61B 2017/00287* (2013.01); *A61B 2017/320024* (2013.01); *A61B 2017/345* (2013.01); *A61B 2017/3443* (2013.01); *A61B 2090/08021* (2016.02)

(58) **Field of Classification Search**
CPC . A61B 17/0293; A61B 17/3431; A61B 17/42; A61B 17/3423; A61B 2017/00287; A61B 46/13; A61B 2017/0225
USPC 128/850, 851, 856; 600/201, 208, 206, 600/215
See application file for complete search history.

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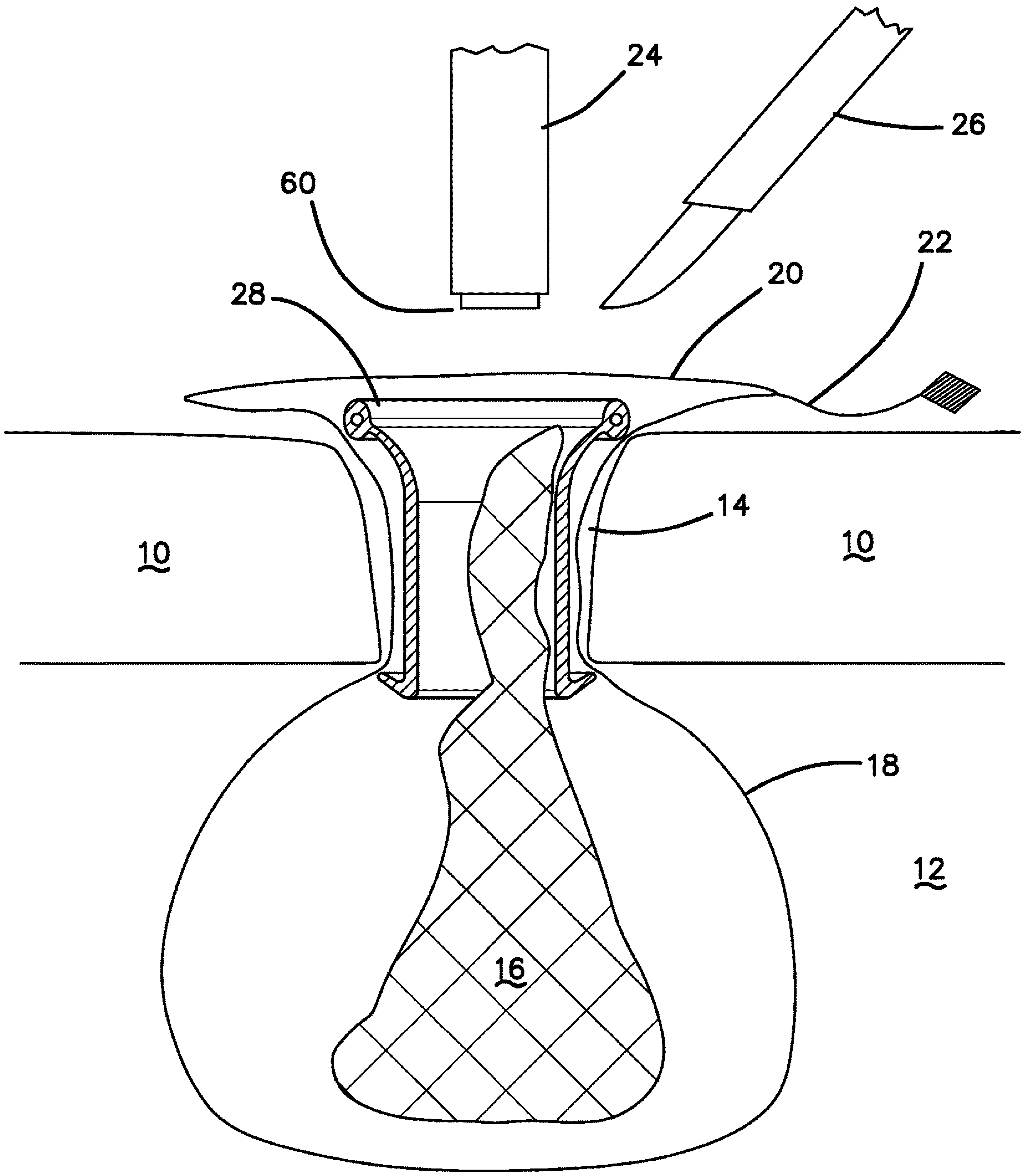

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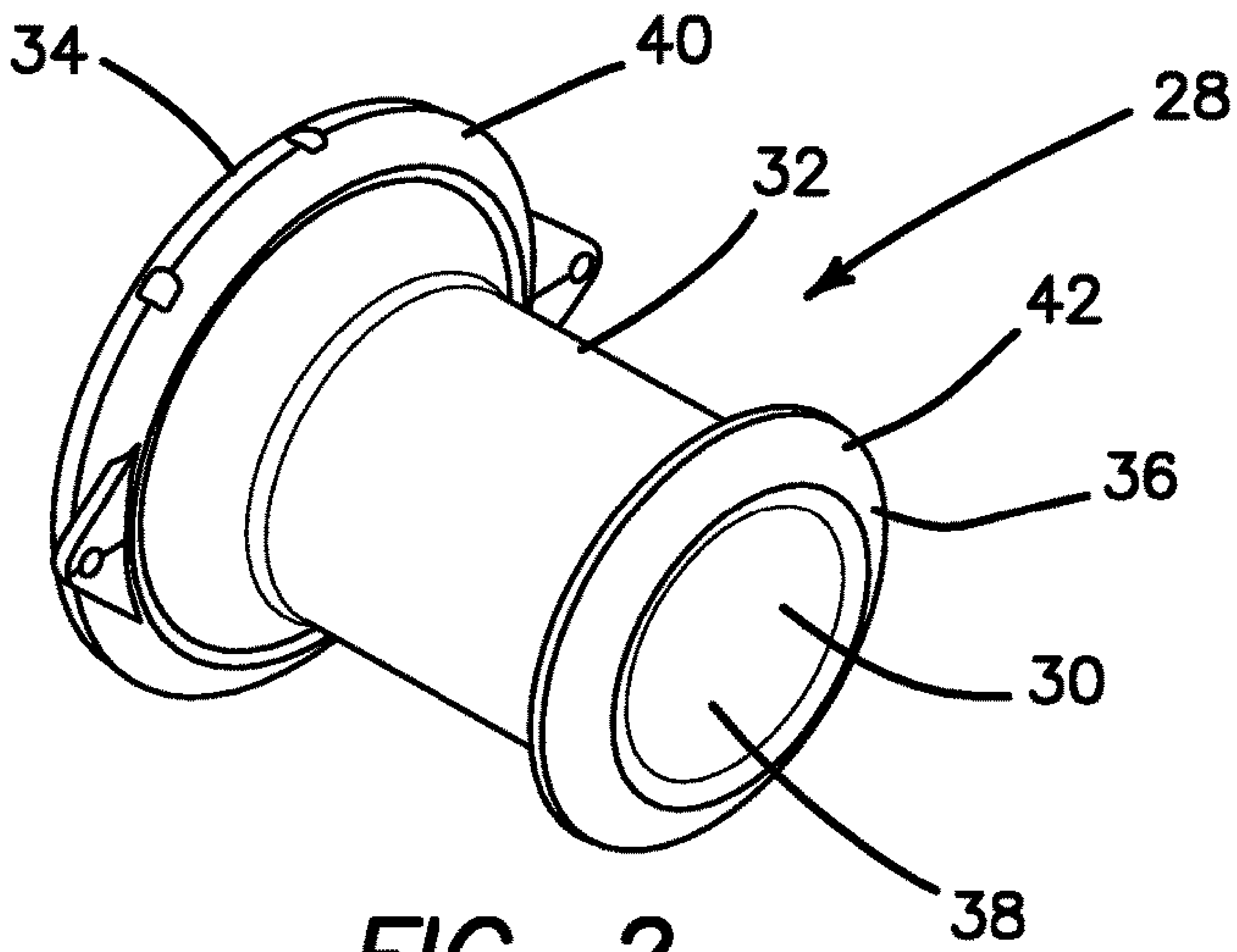

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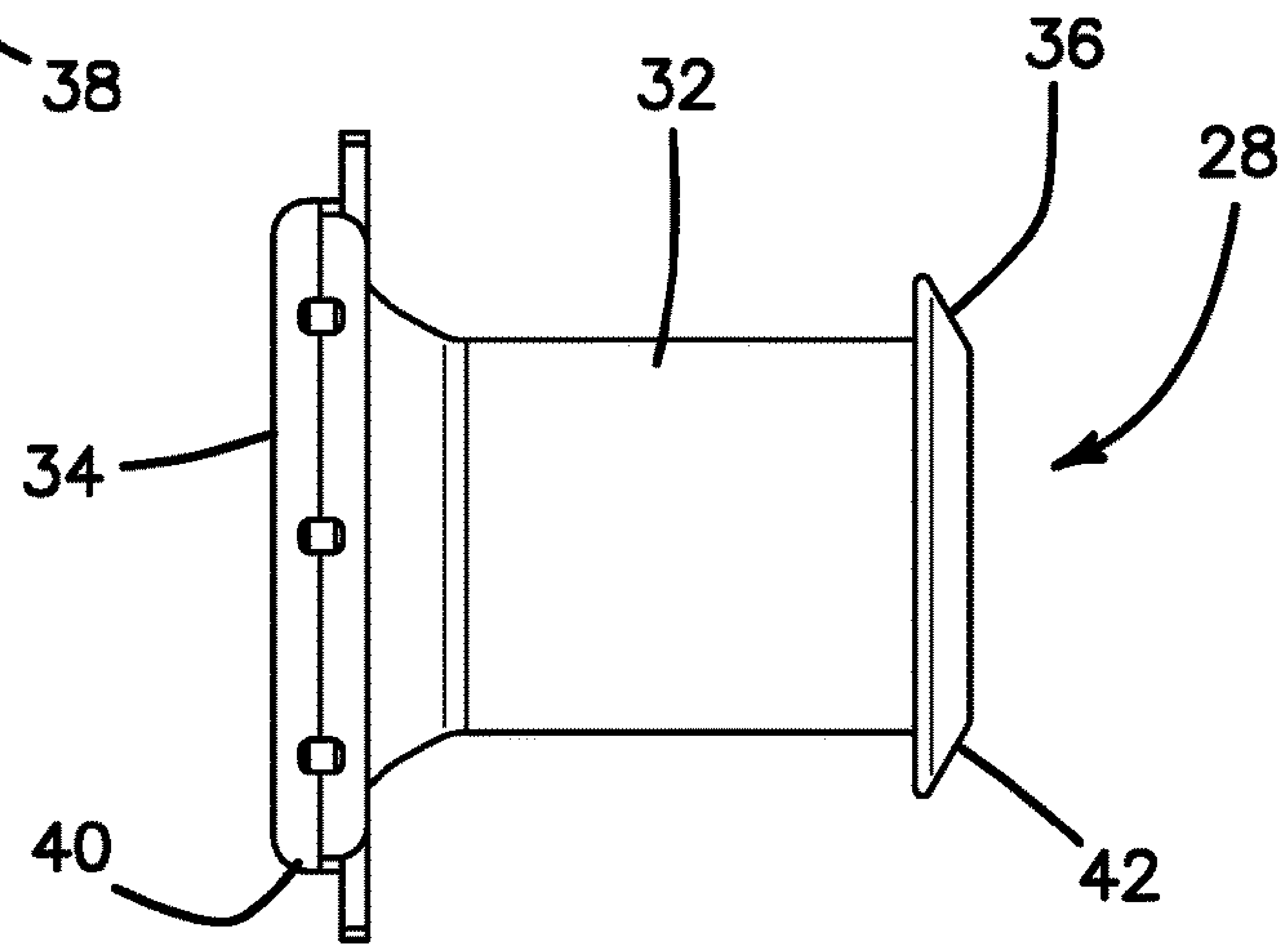

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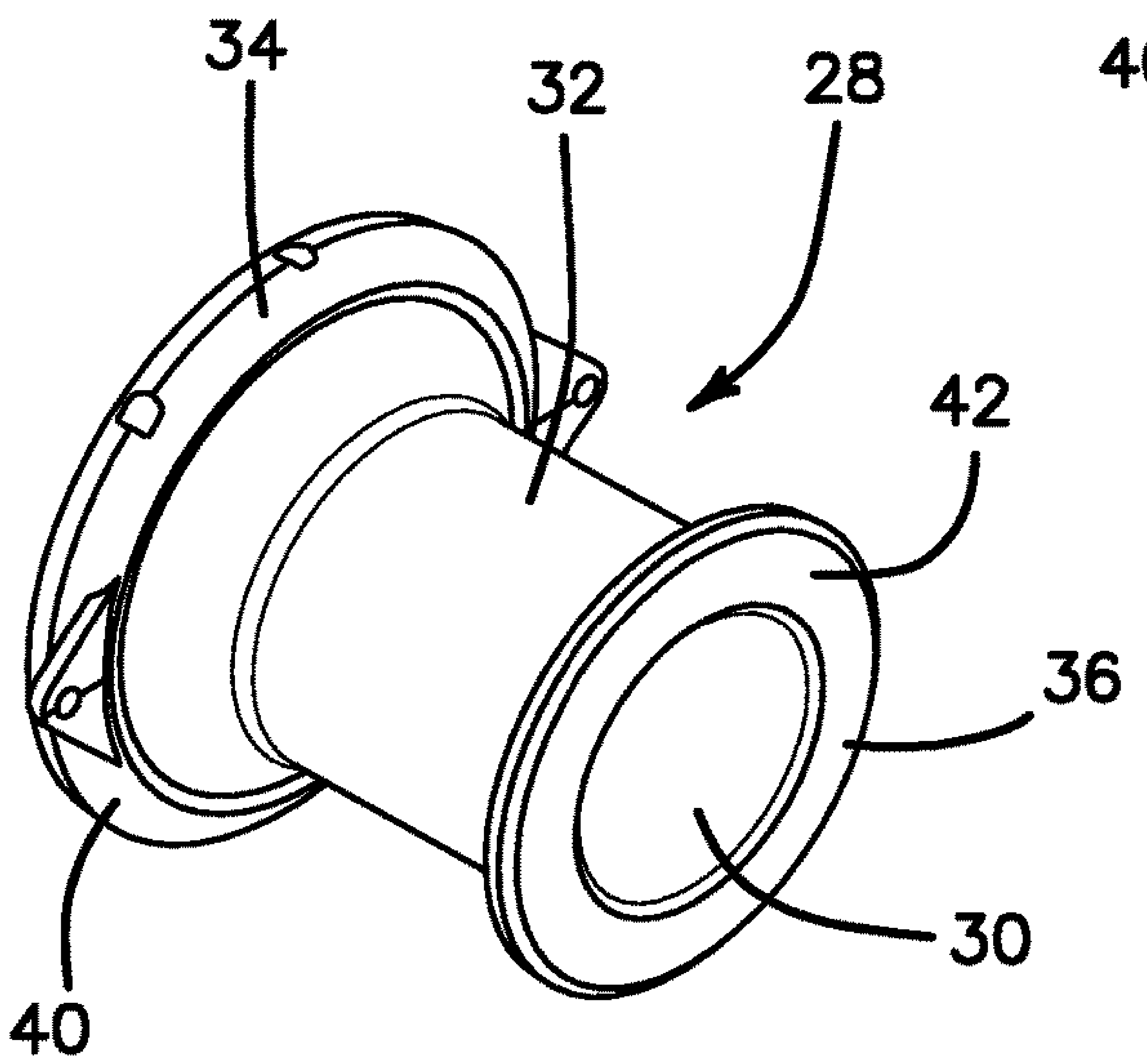

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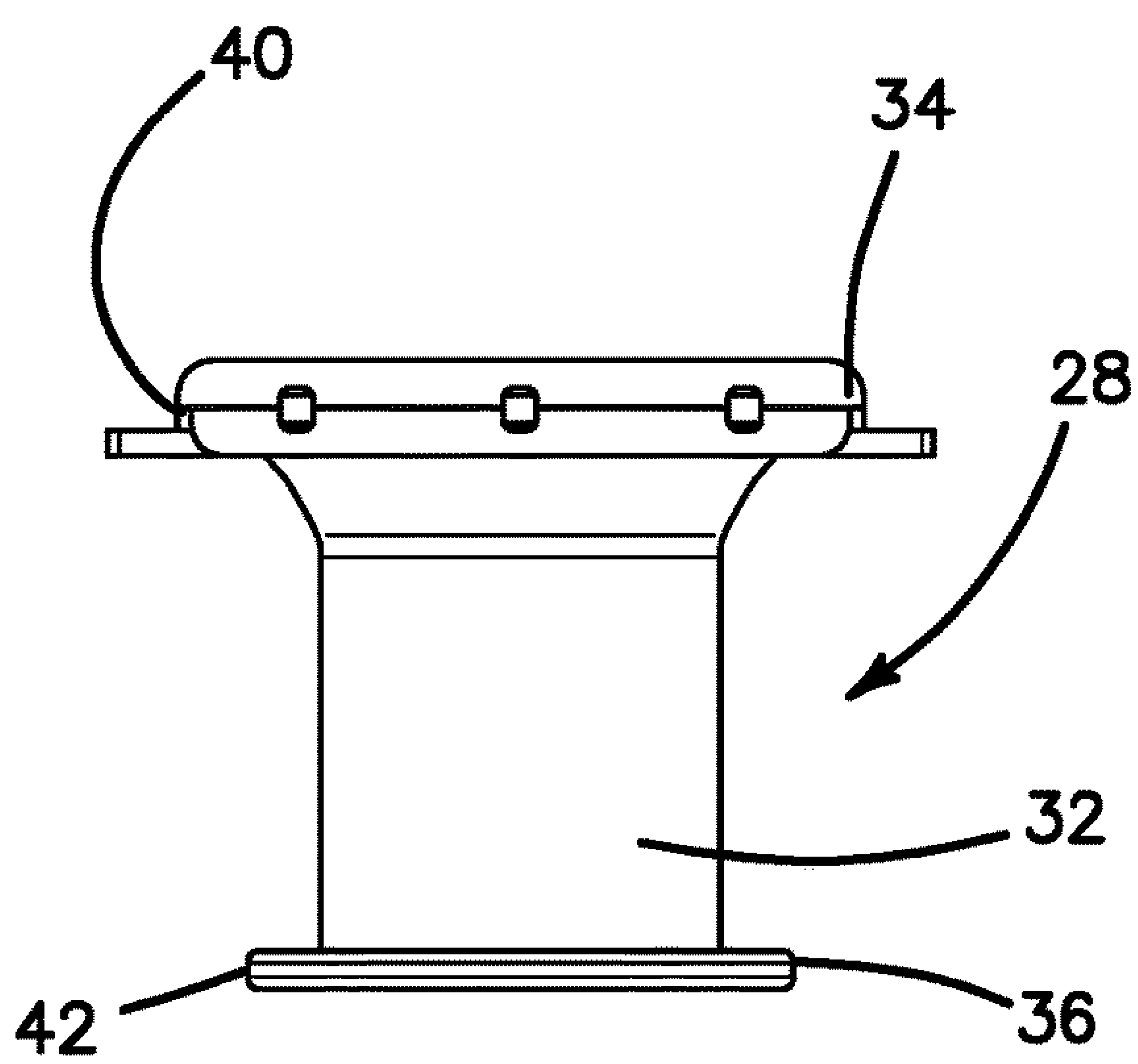

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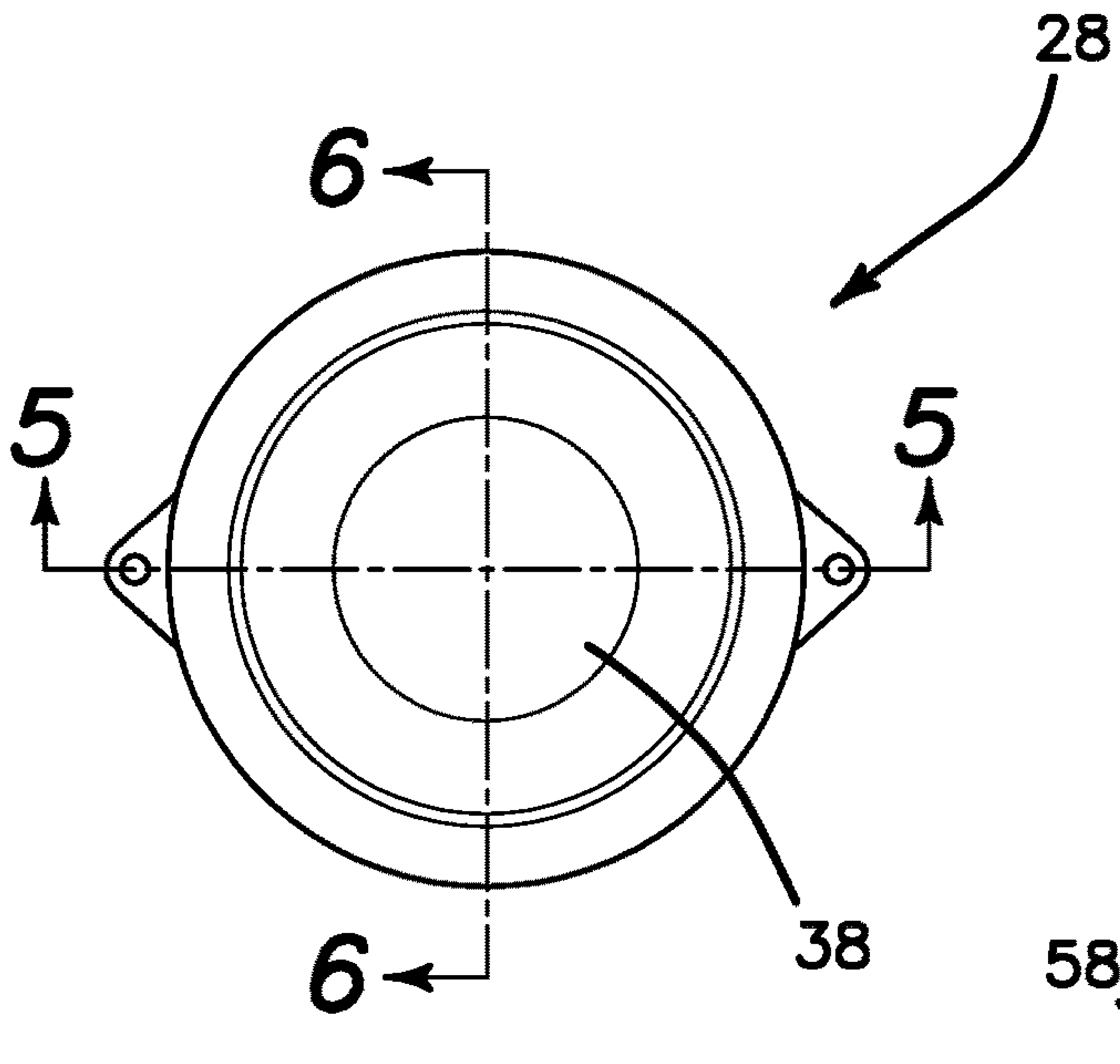
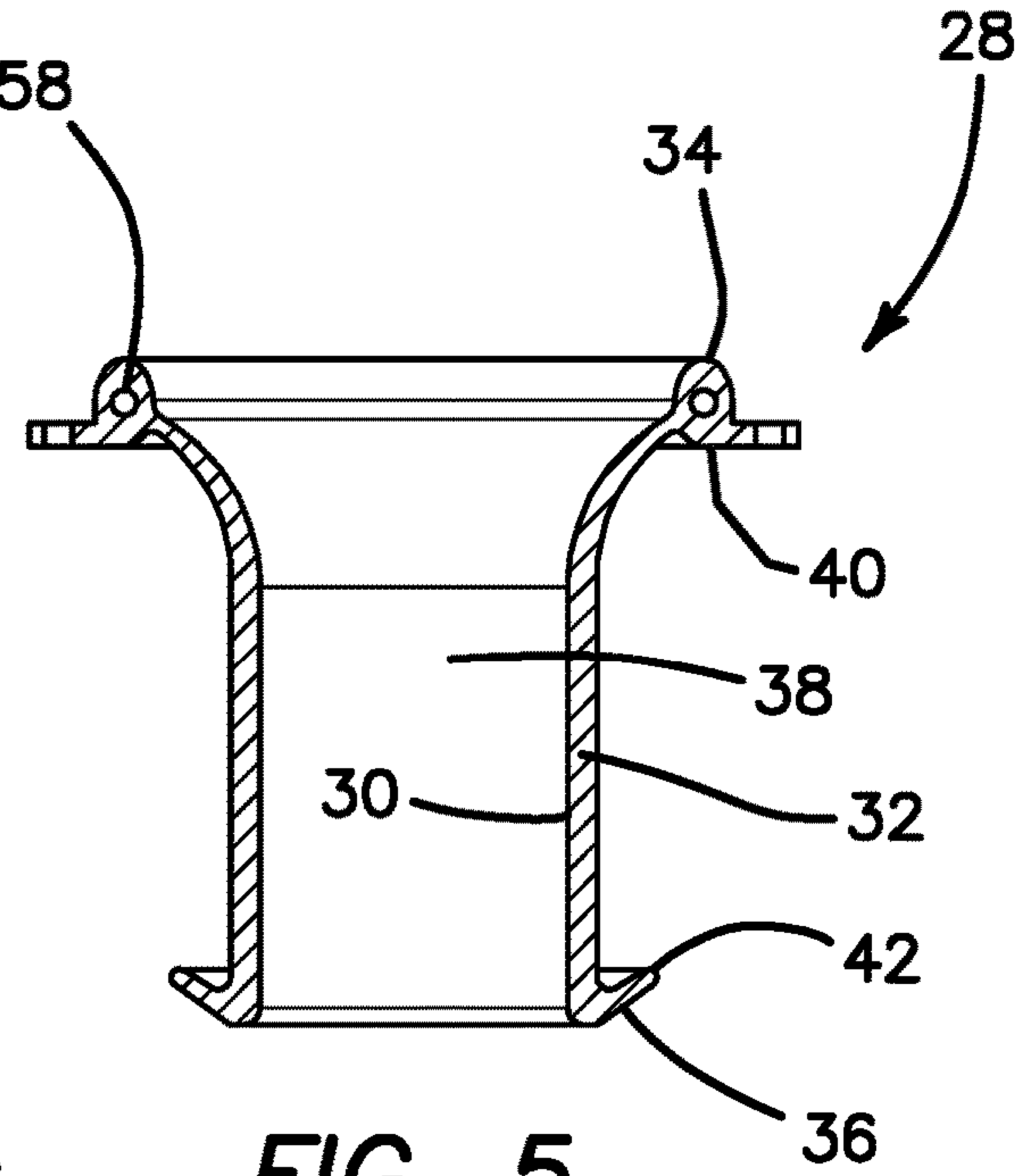


FIG. 4



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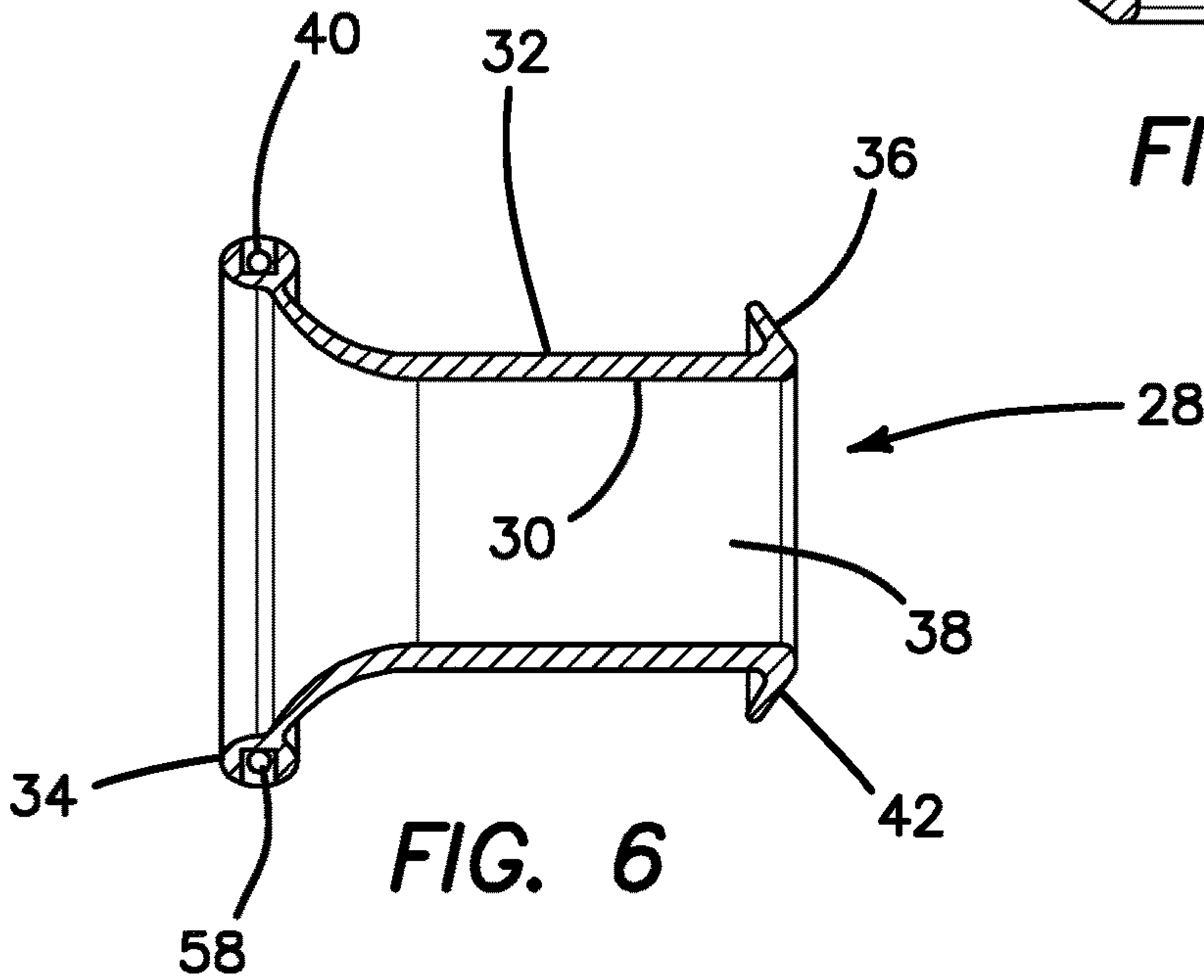

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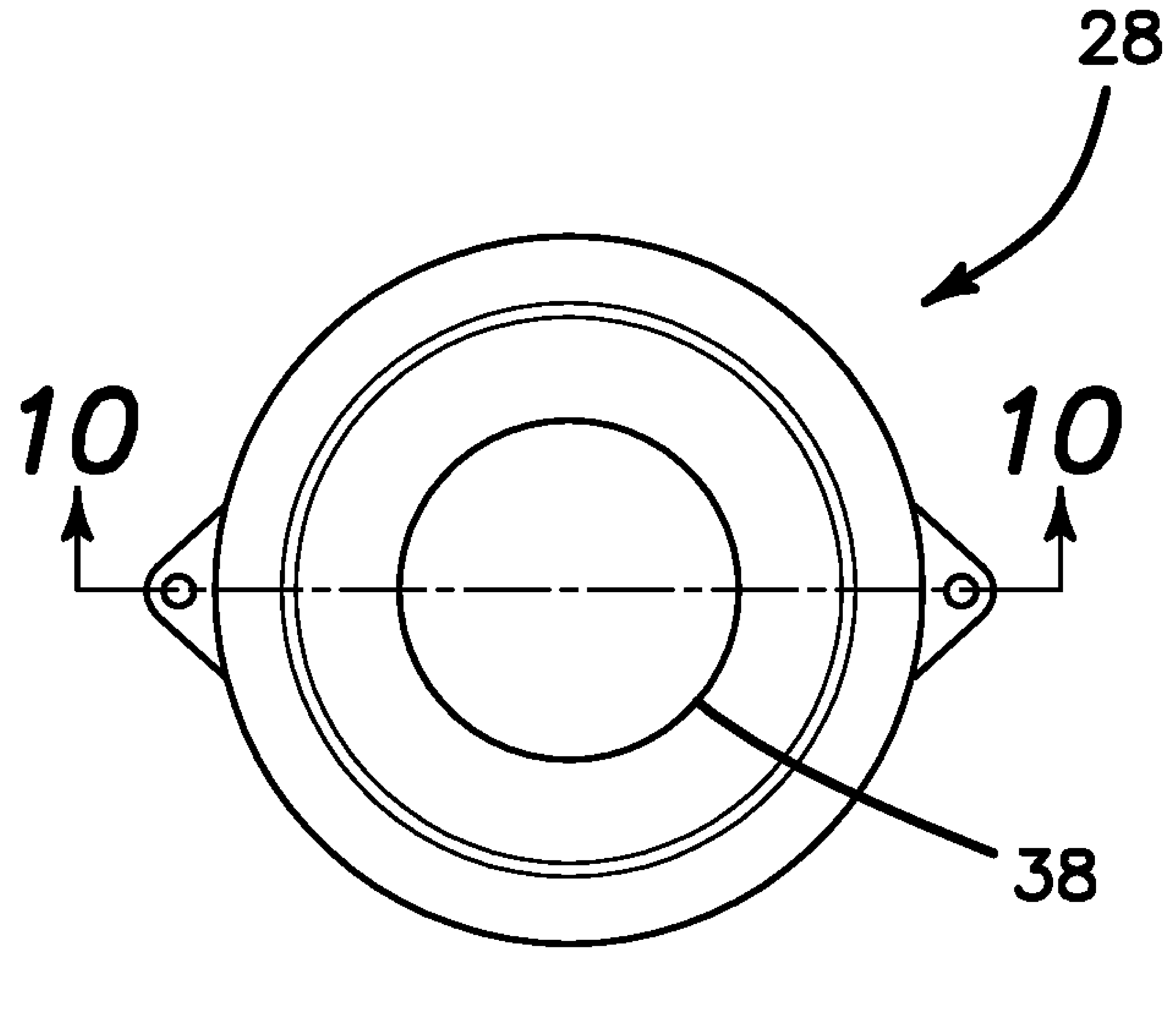

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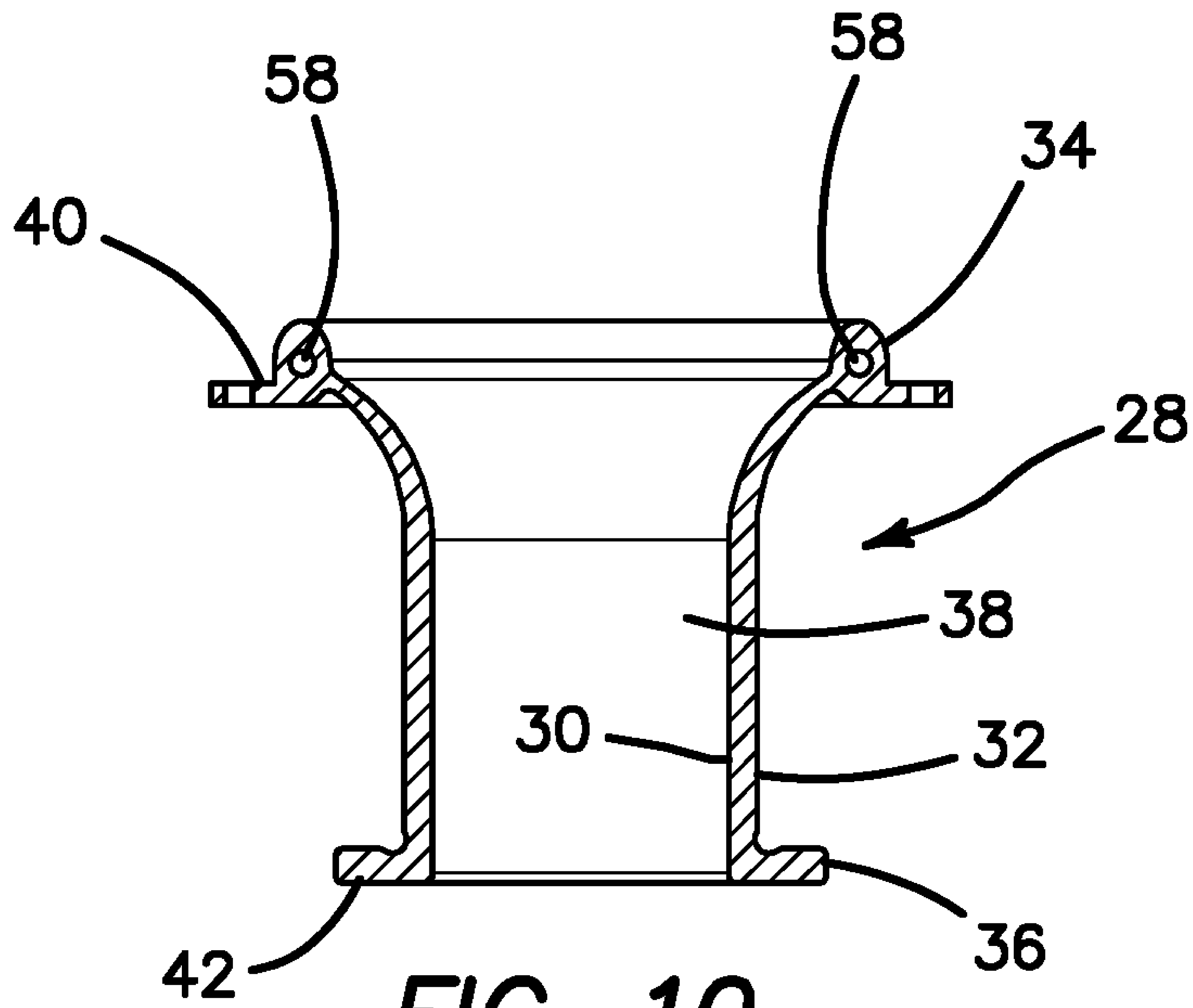

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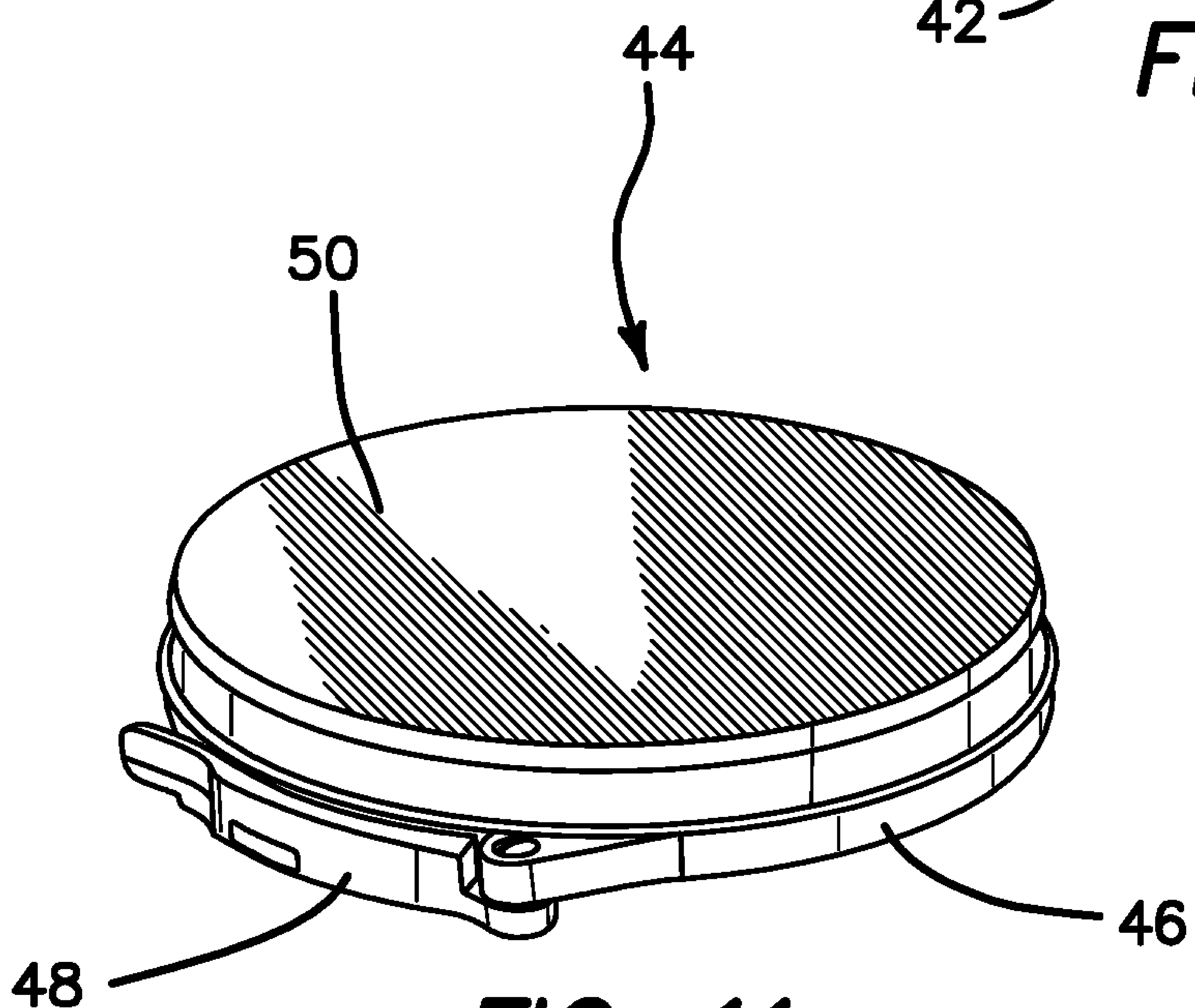

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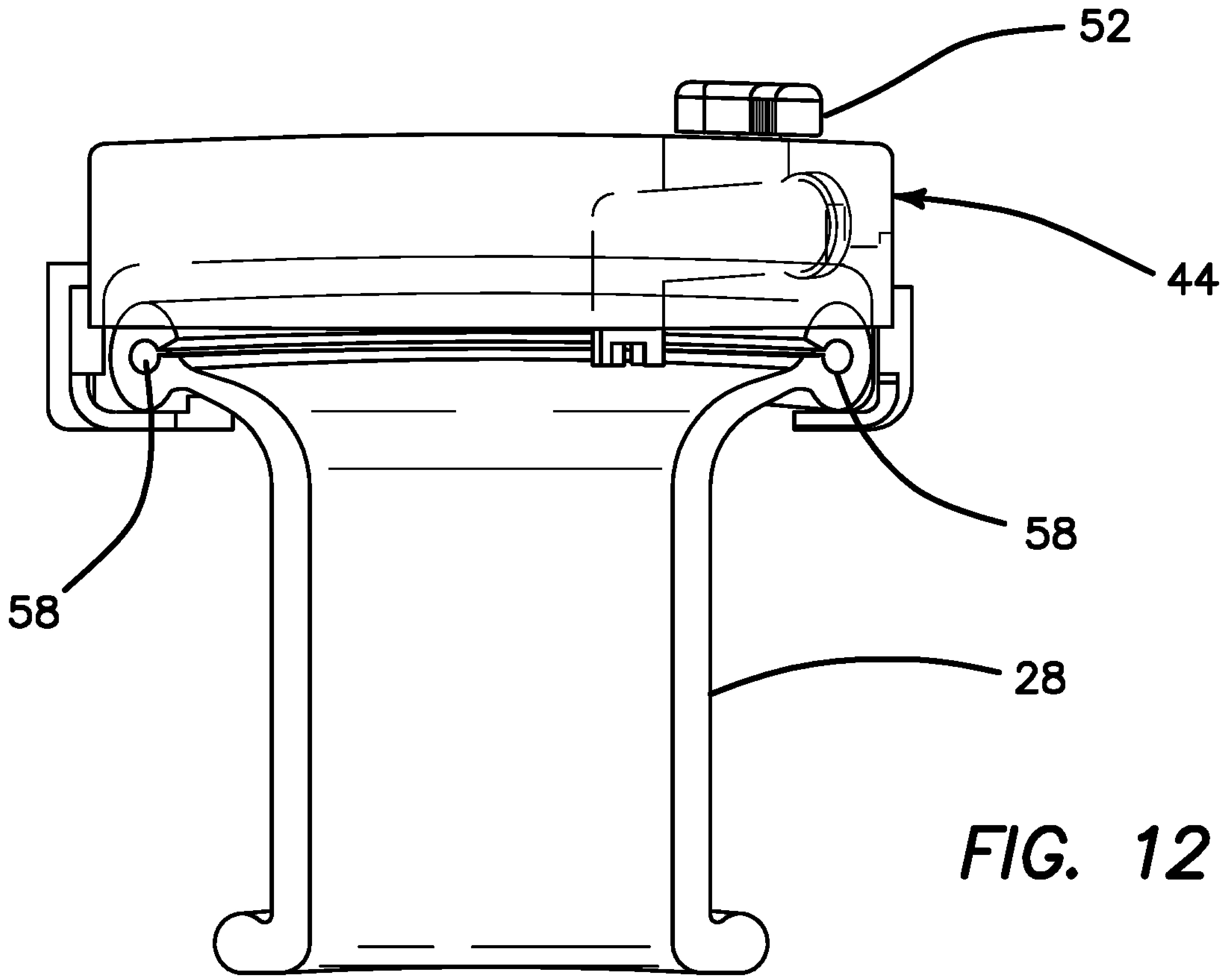

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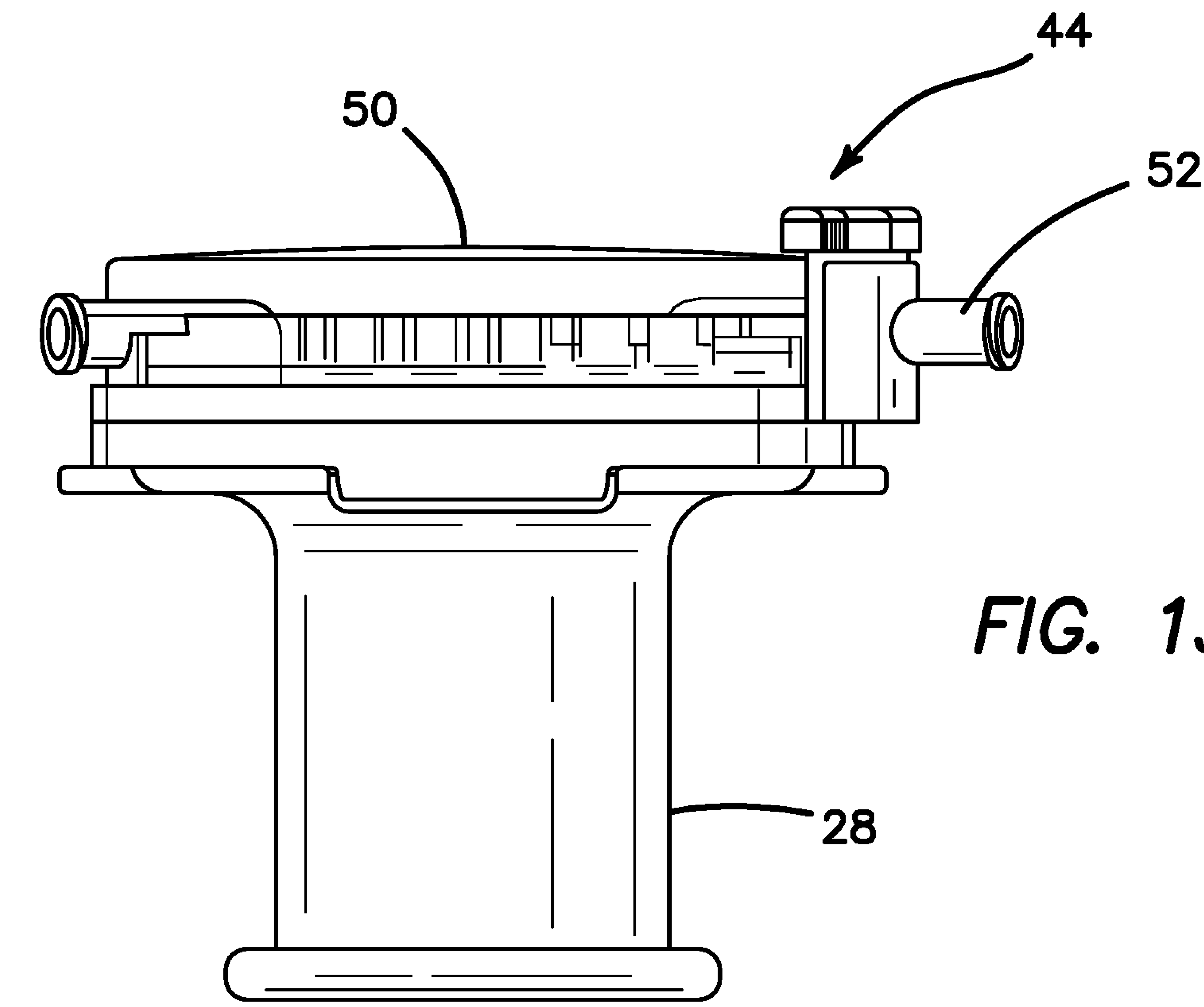

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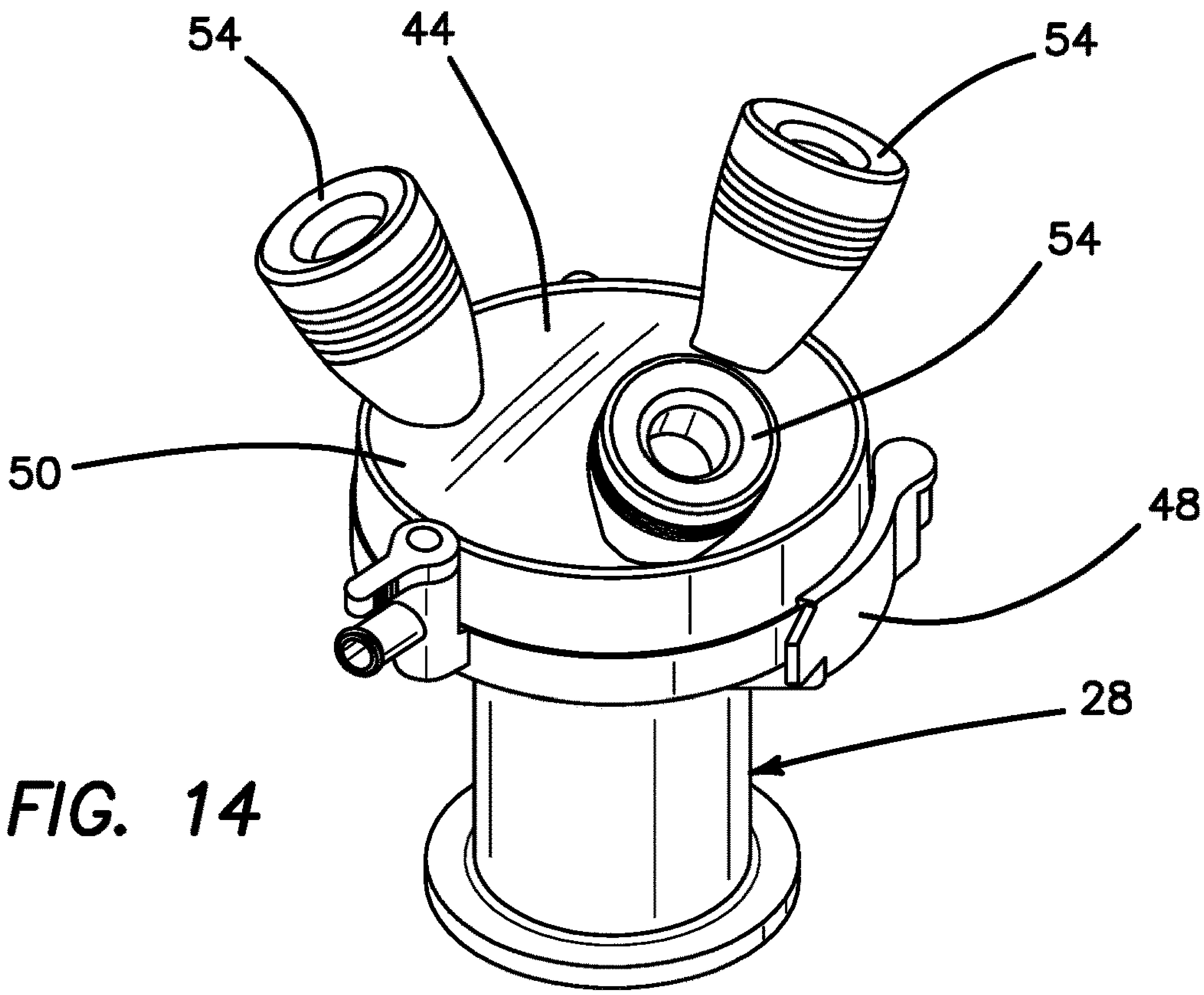


FIG. 14

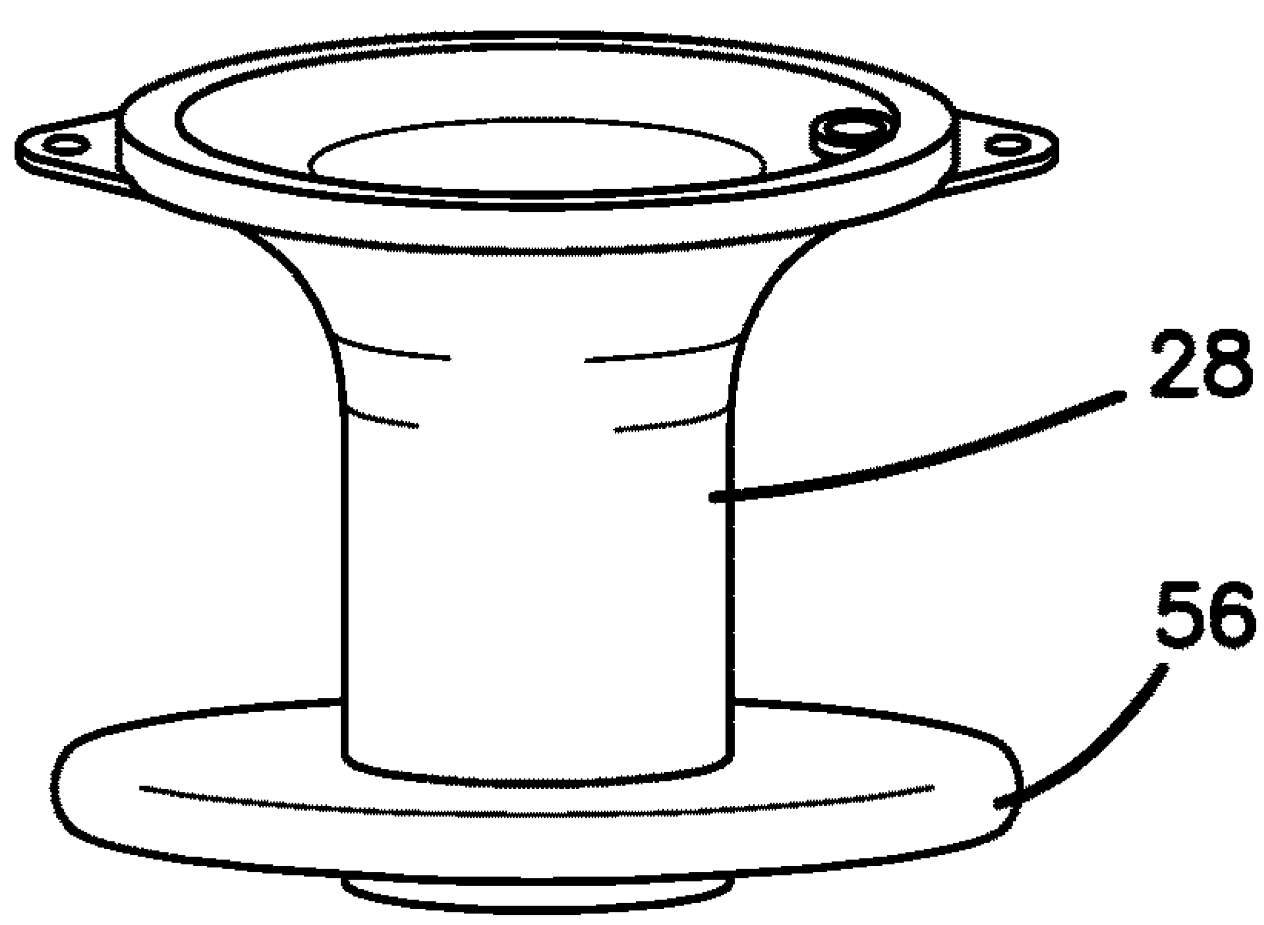
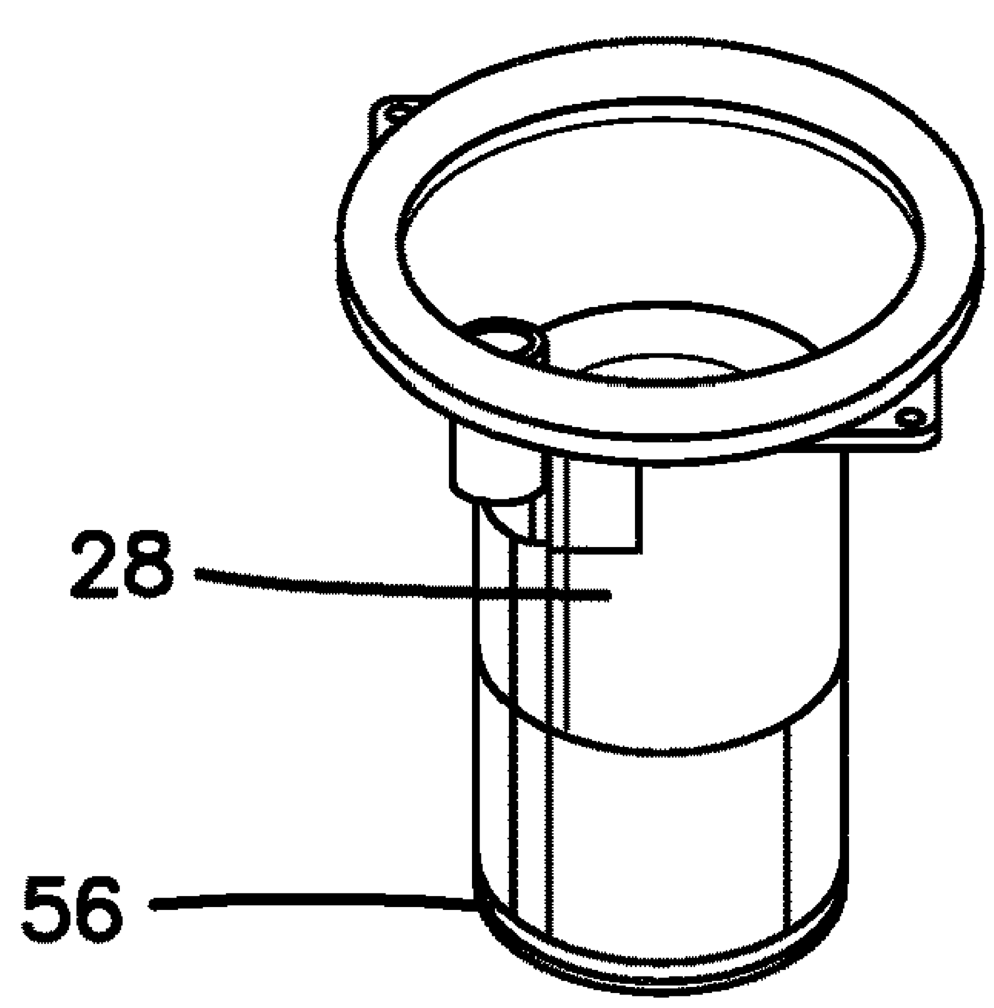


FIG. 15



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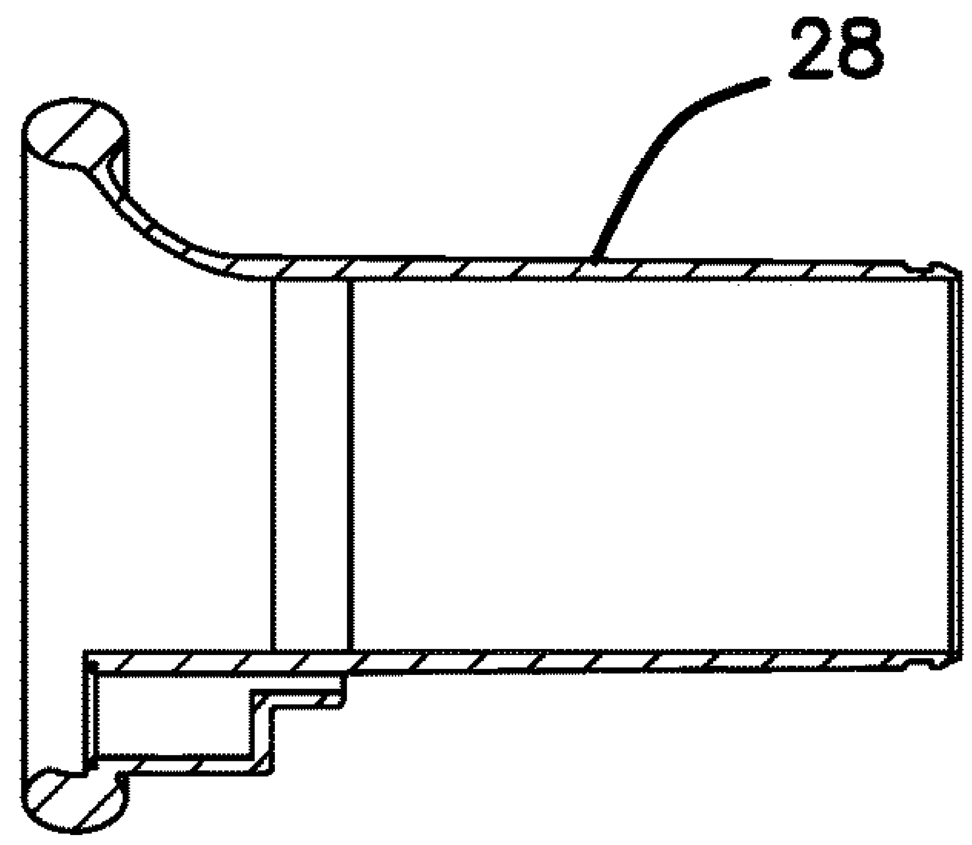


FIG. 17

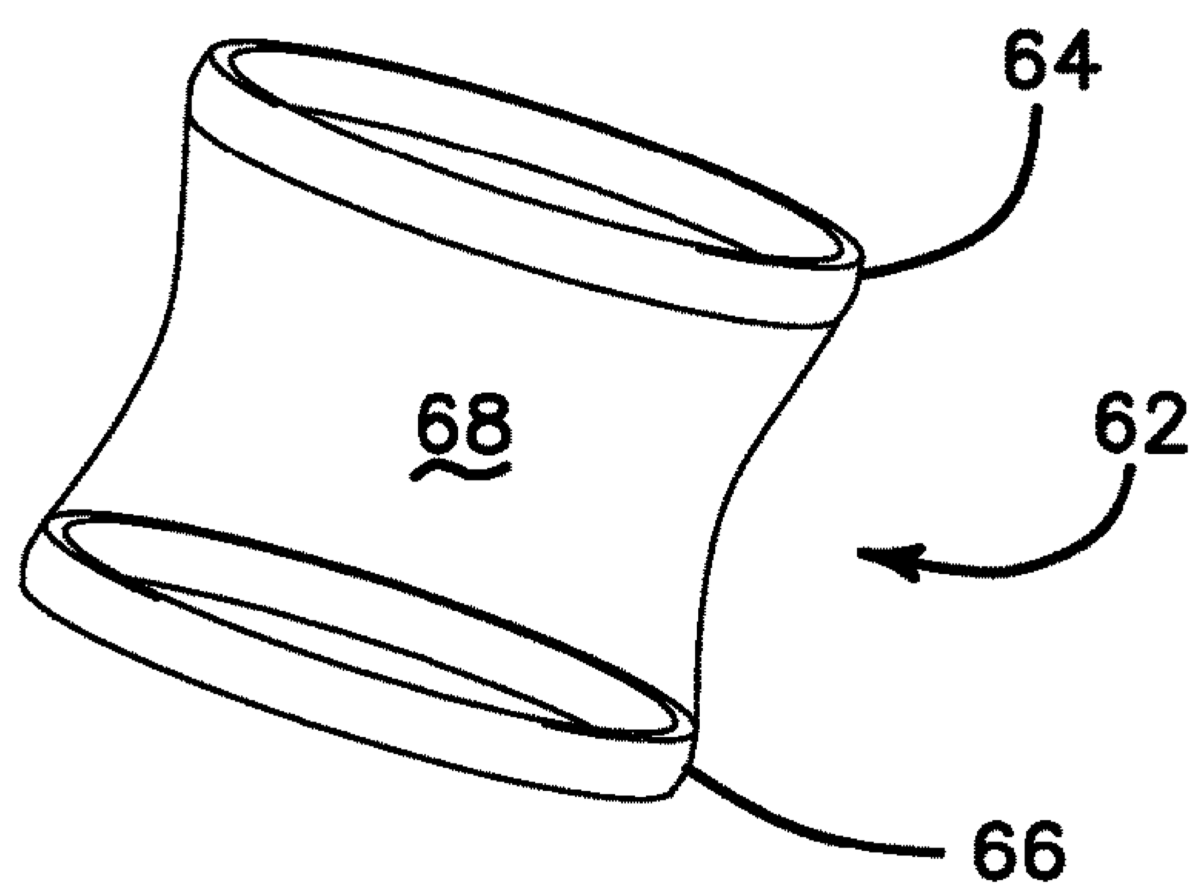


FIG. 18

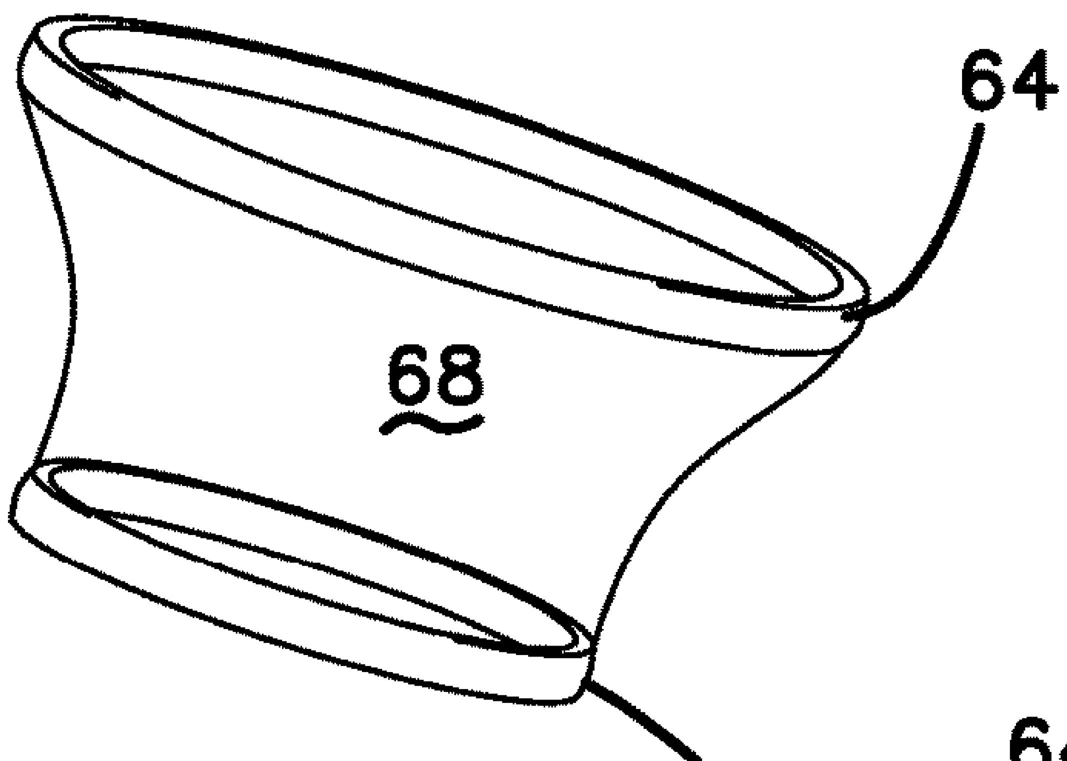


FIG. 19

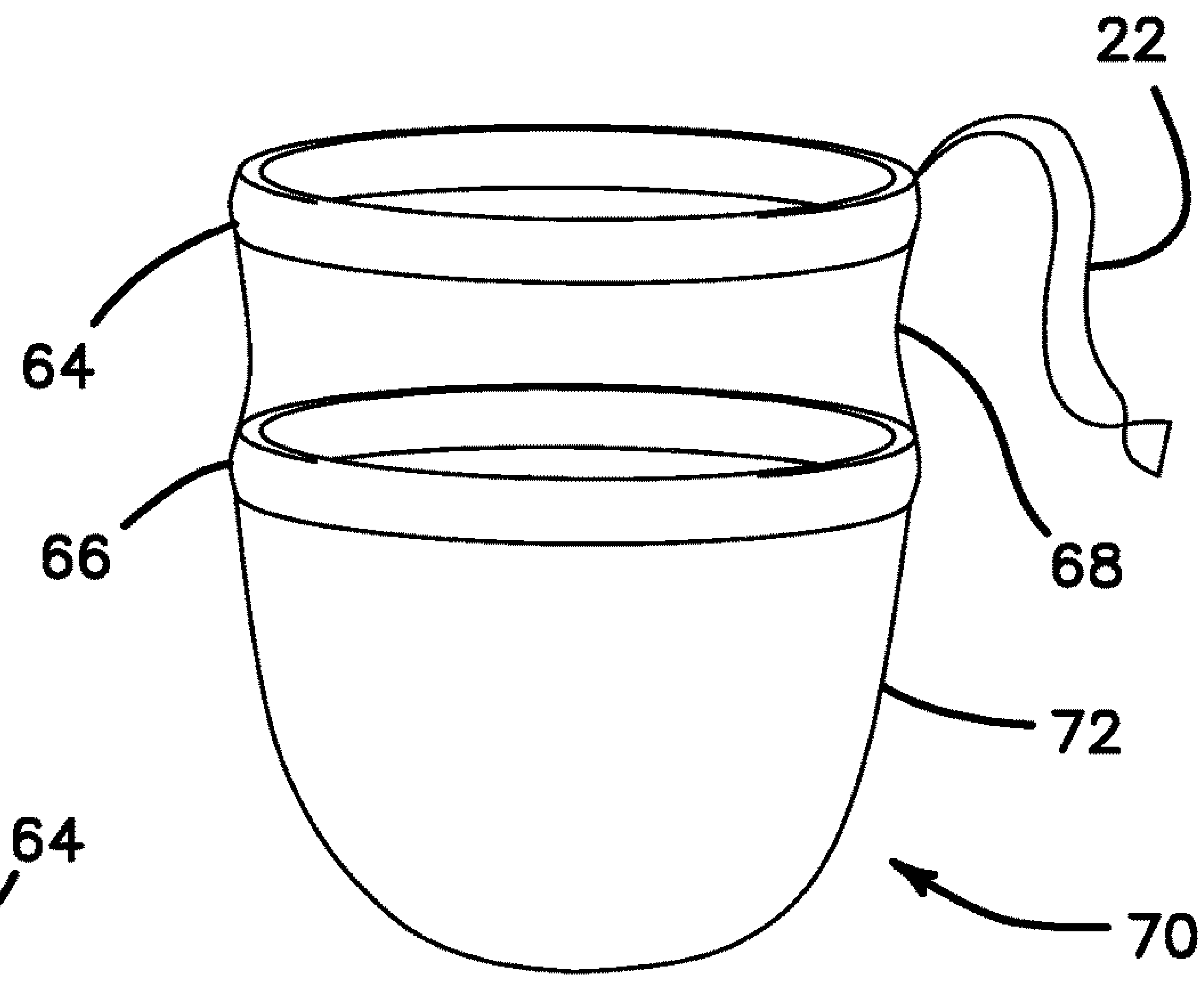


FIG. 20A

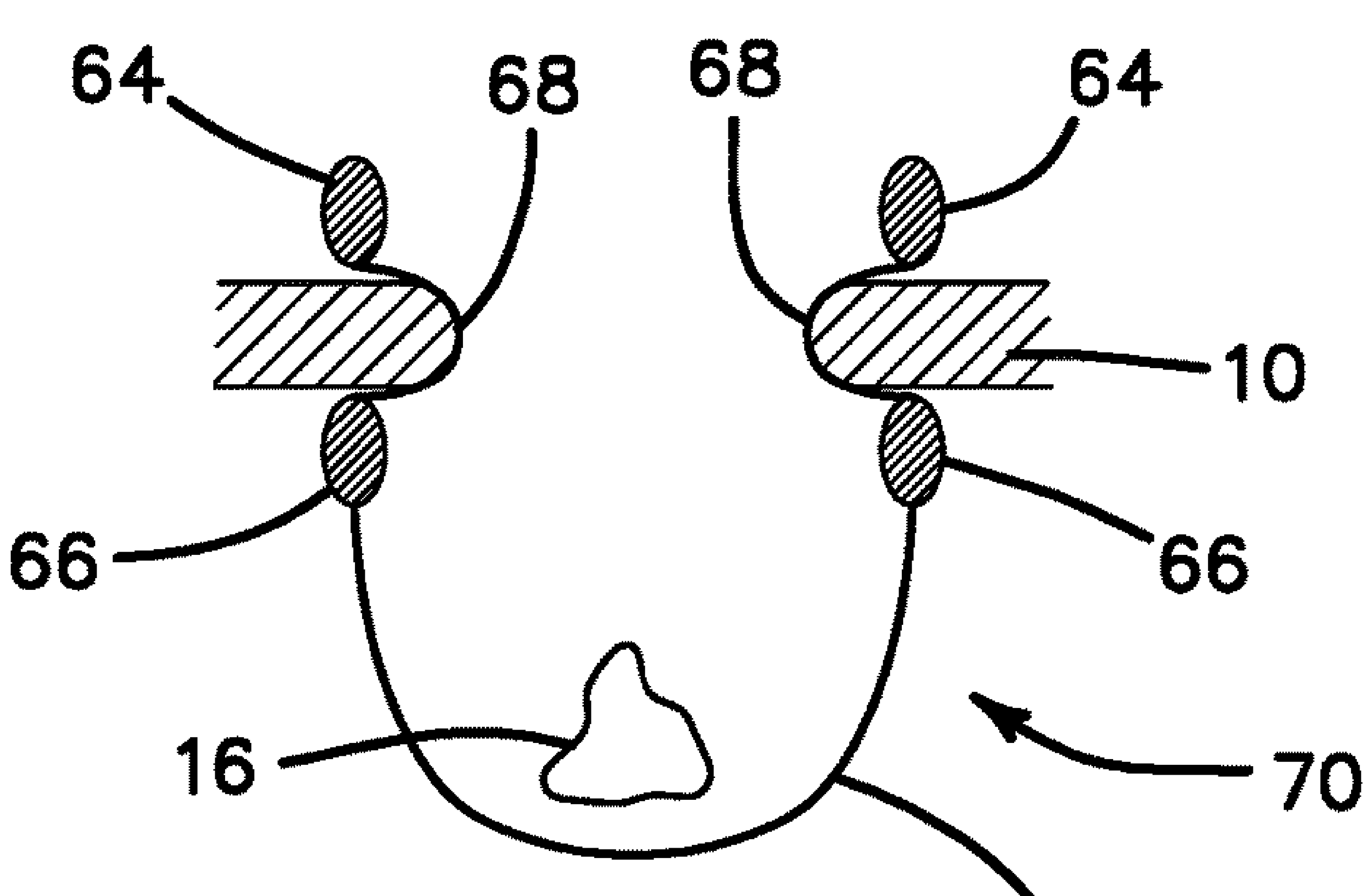


FIG. 20B

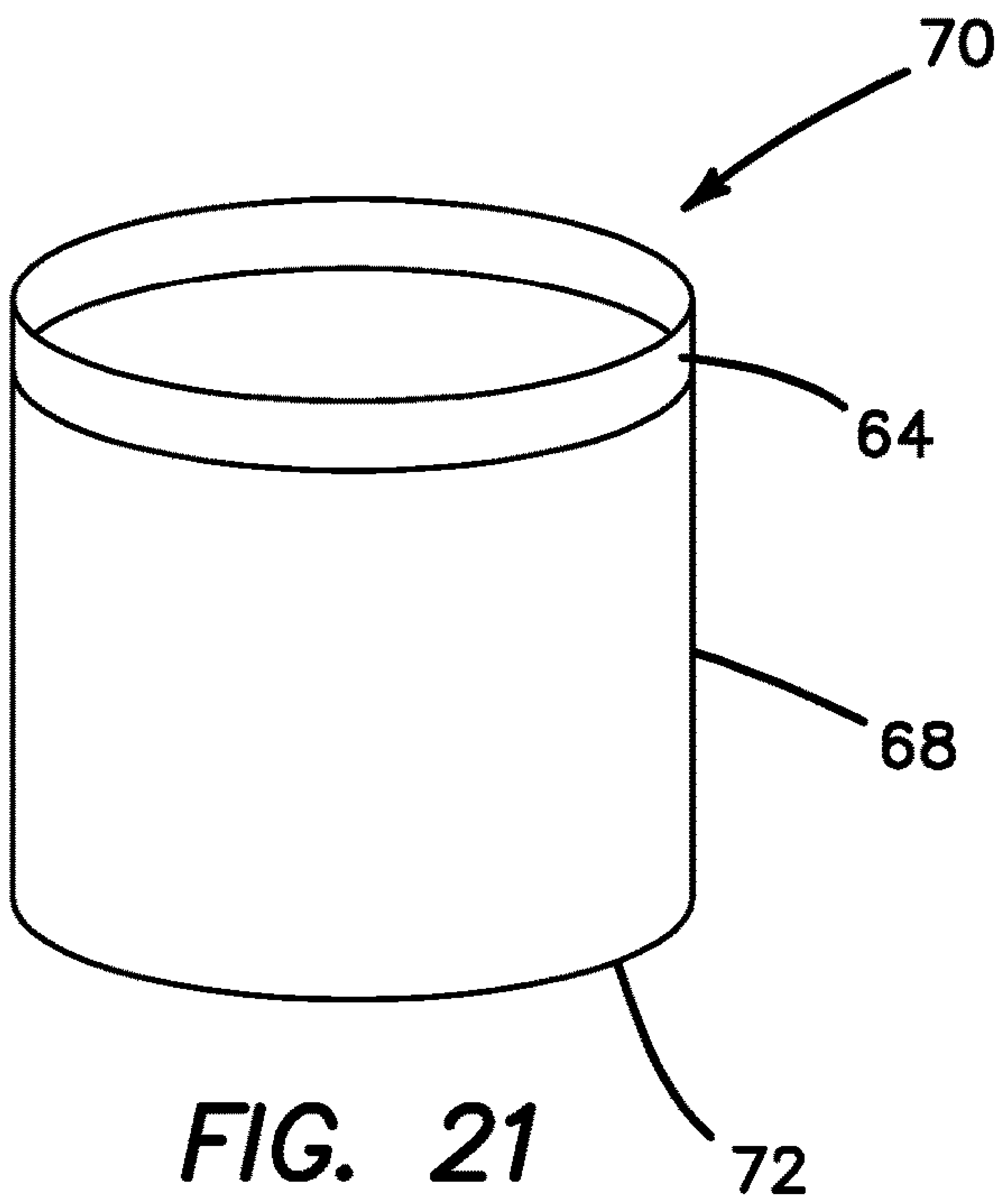


FIG. 21

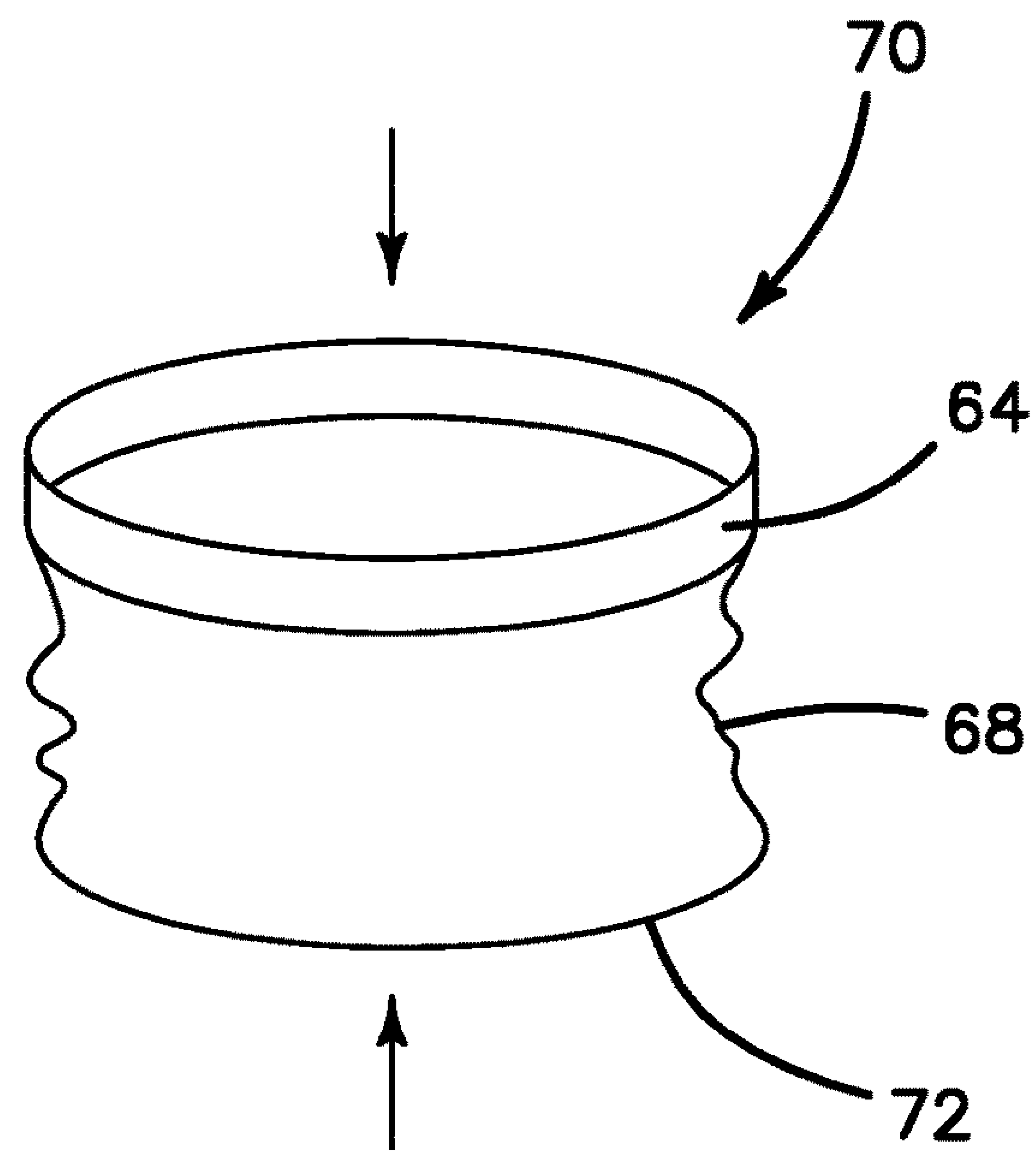


FIG. 22

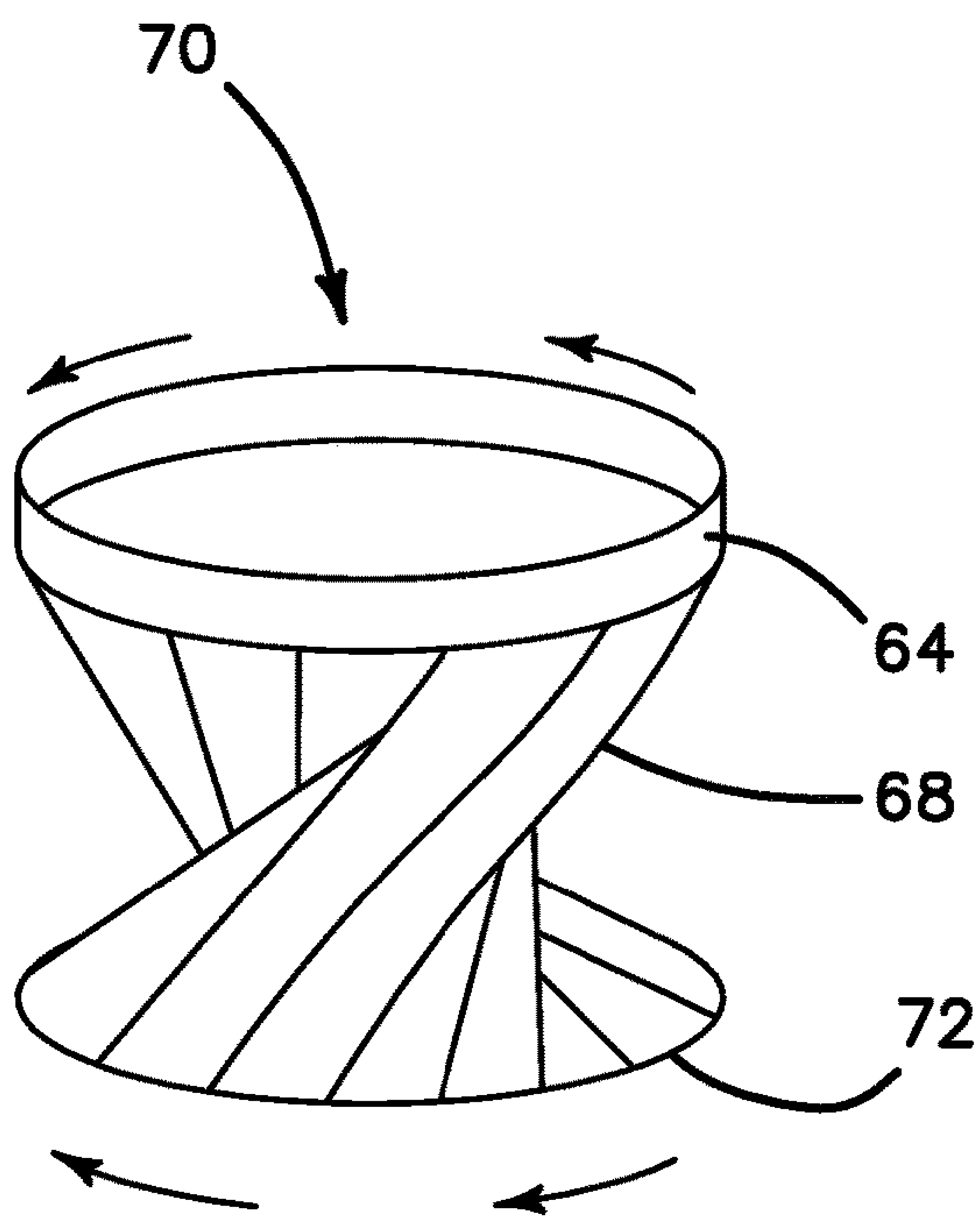


FIG. 23

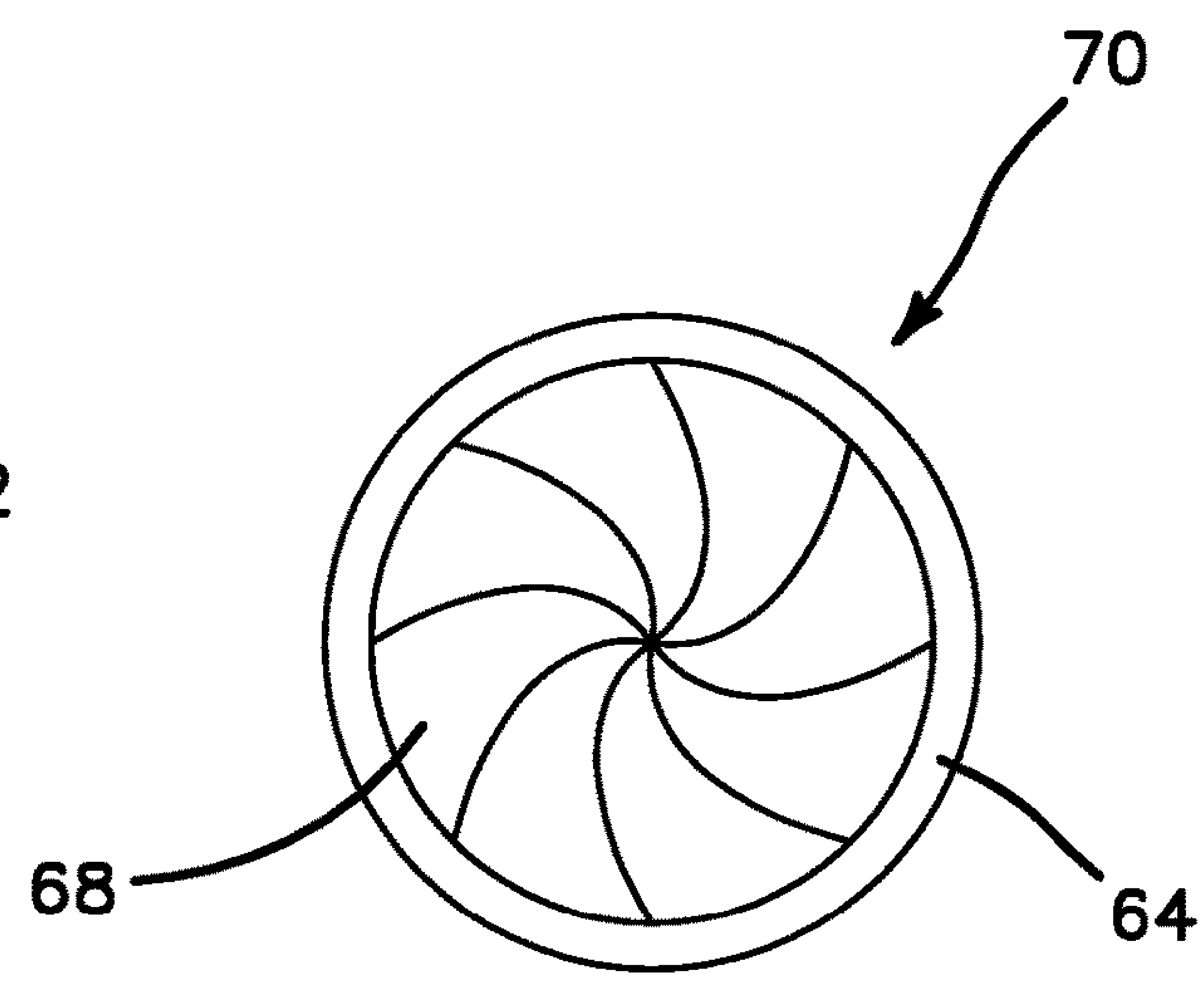


FIG. 24

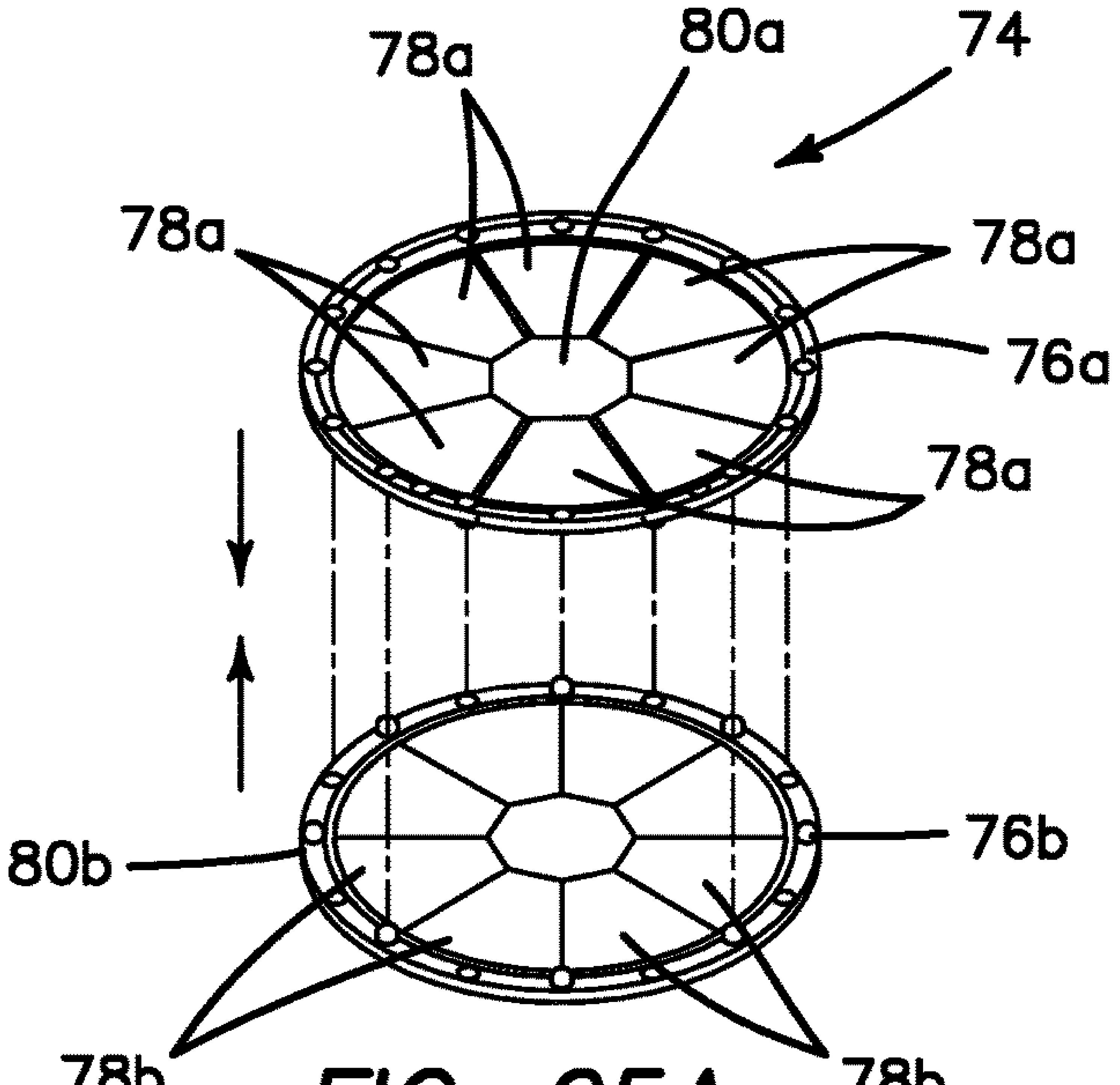


FIG. 25A

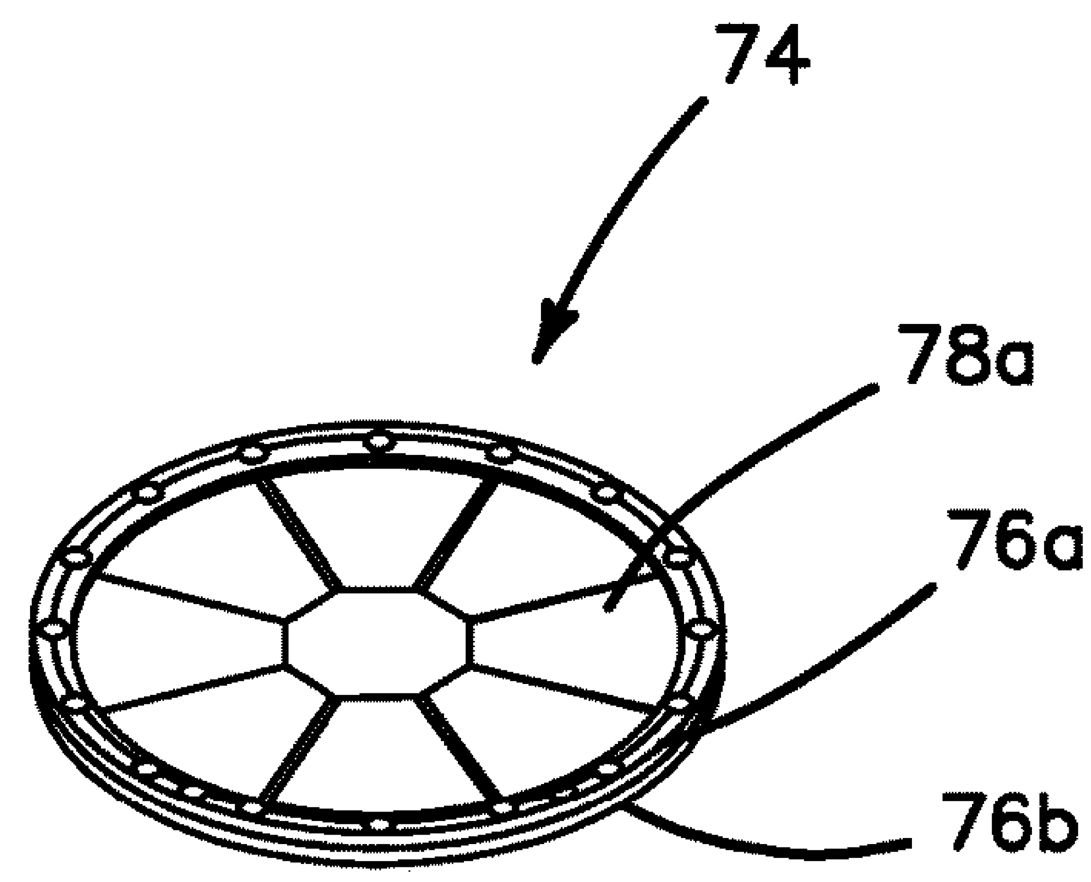


FIG. 25B

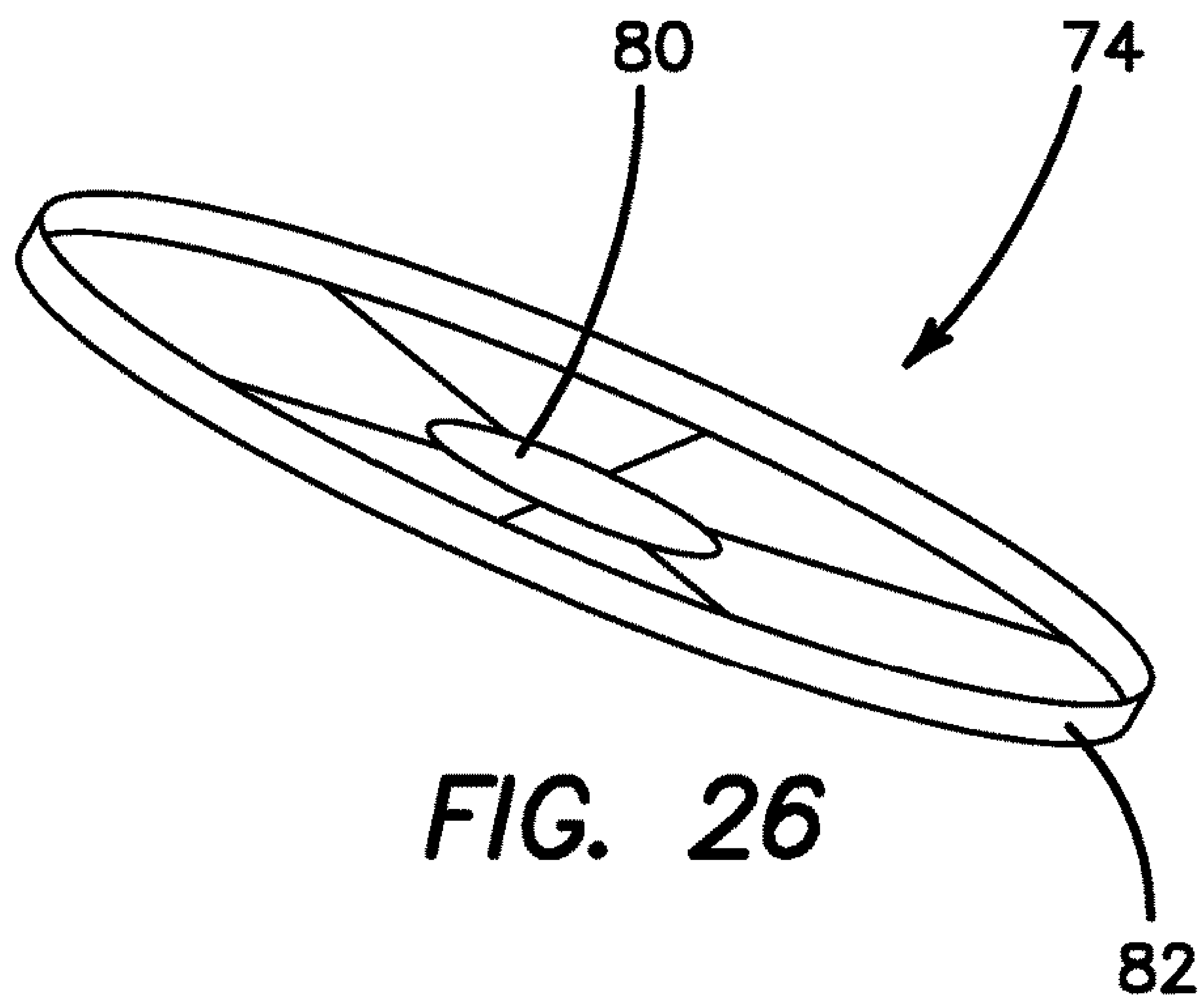


FIG. 26

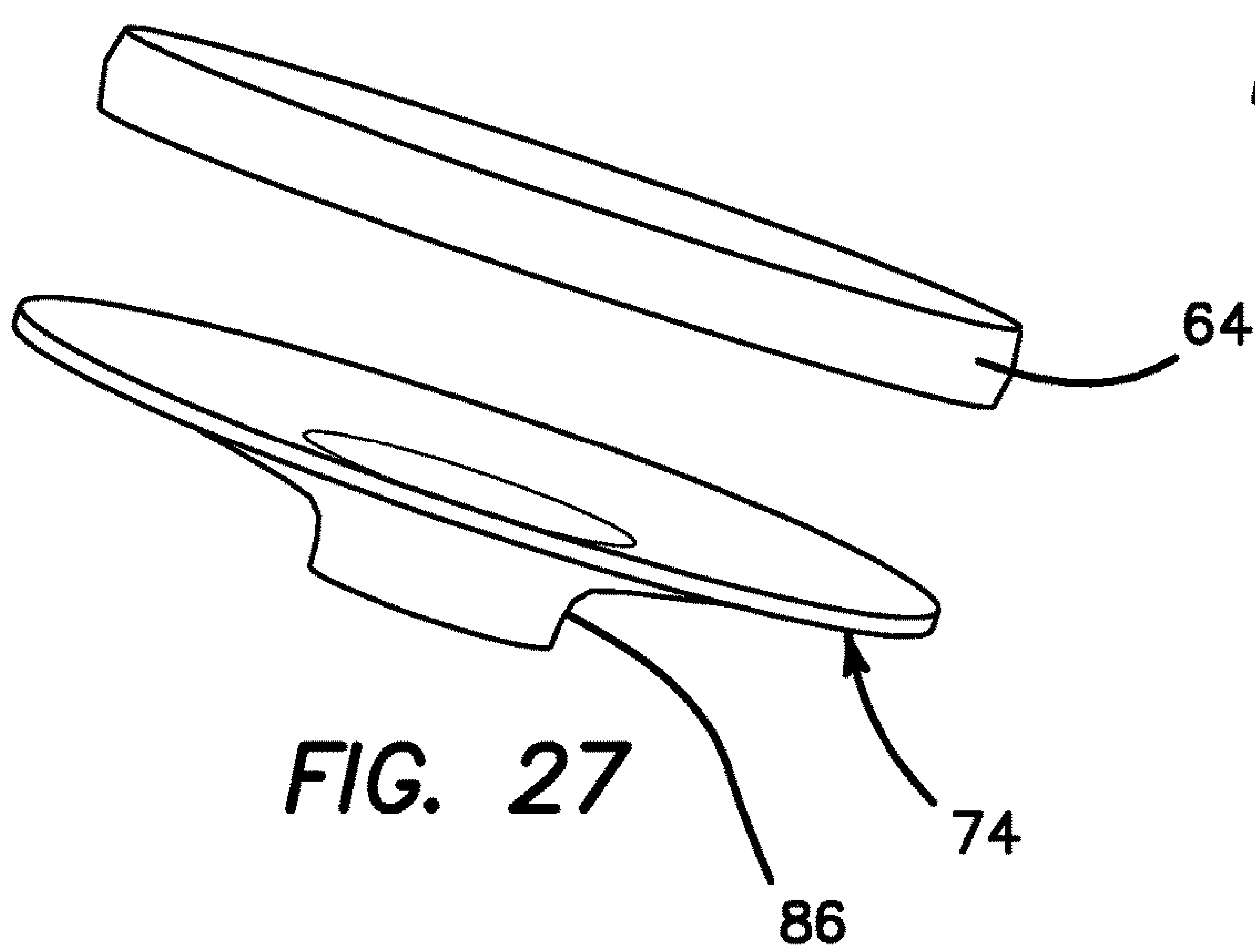


FIG. 27

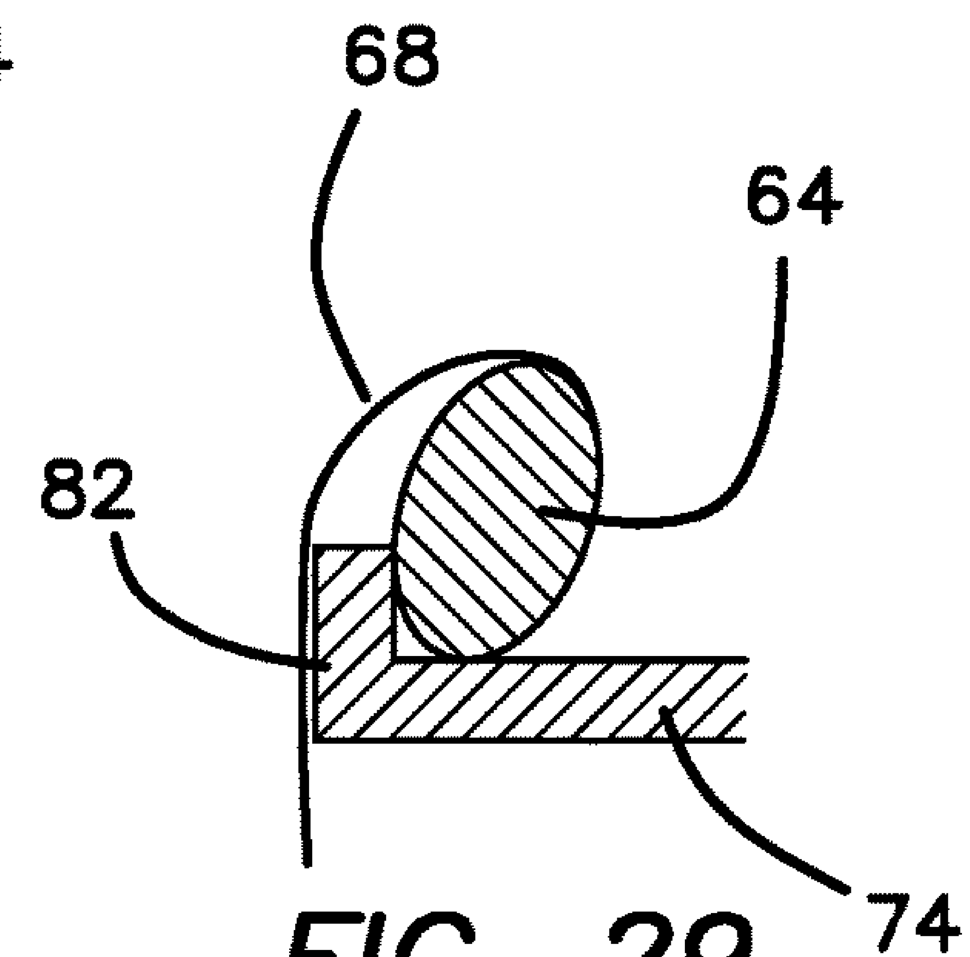


FIG. 29

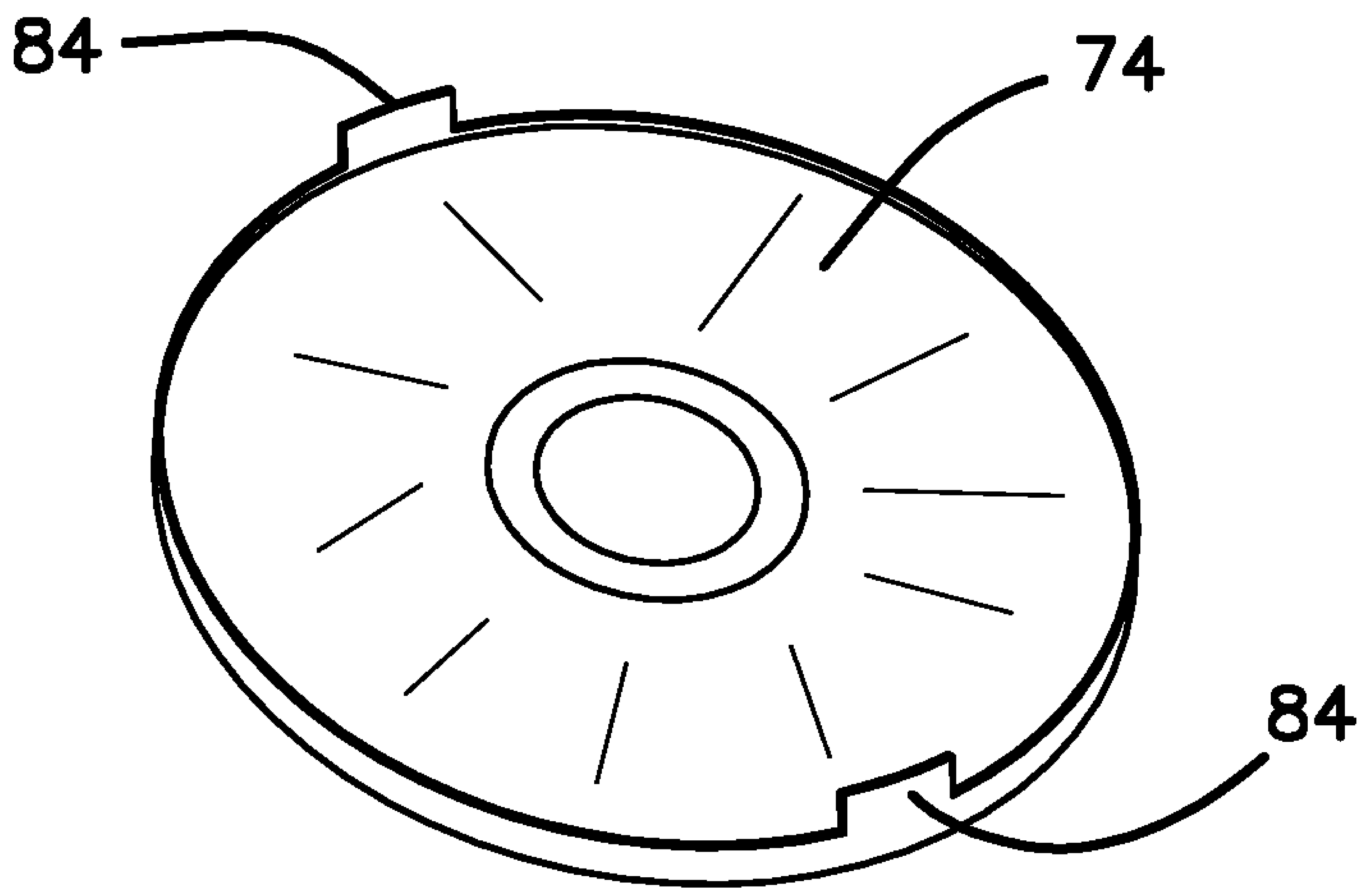
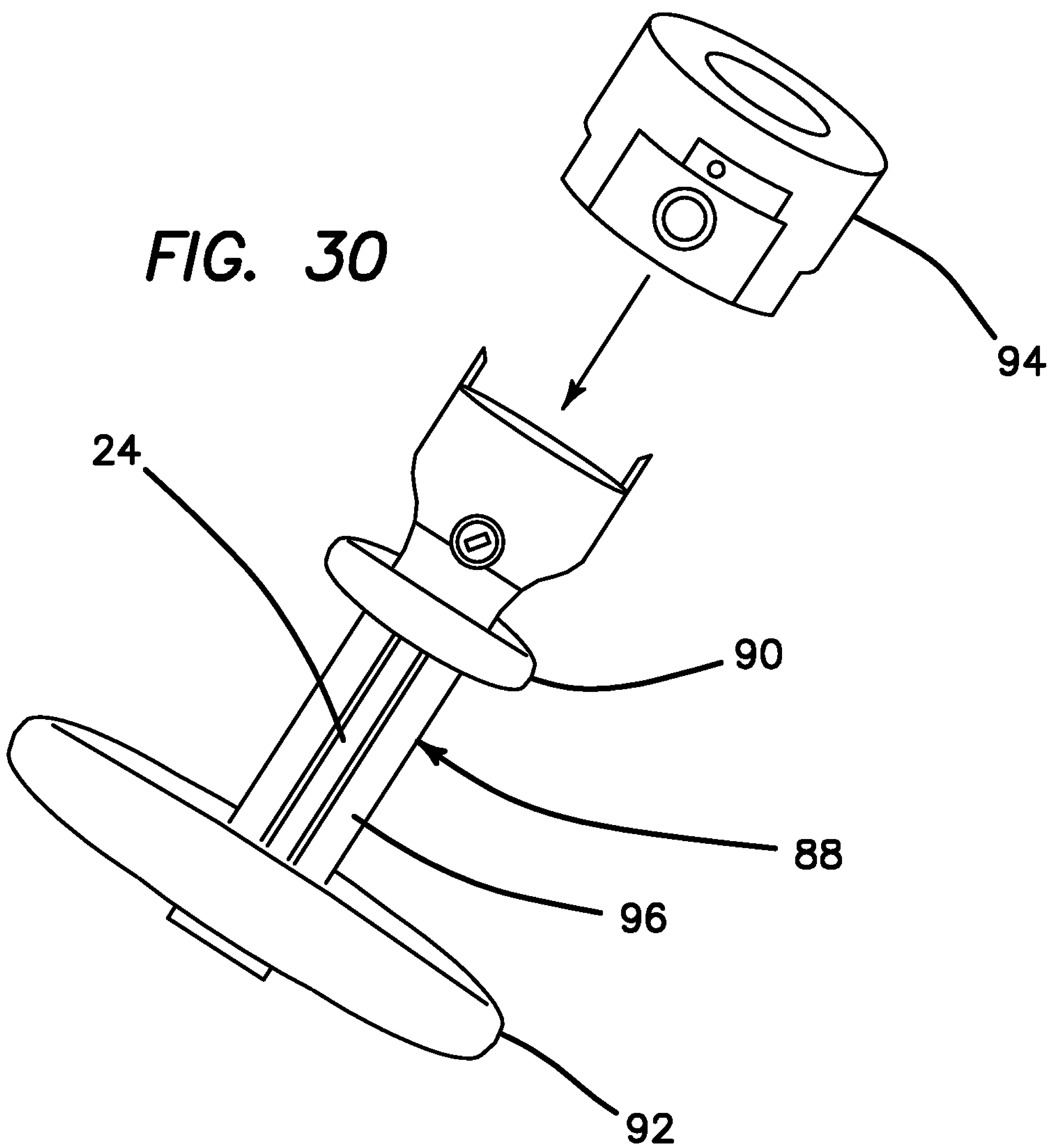


FIG. 28

FIG. 30



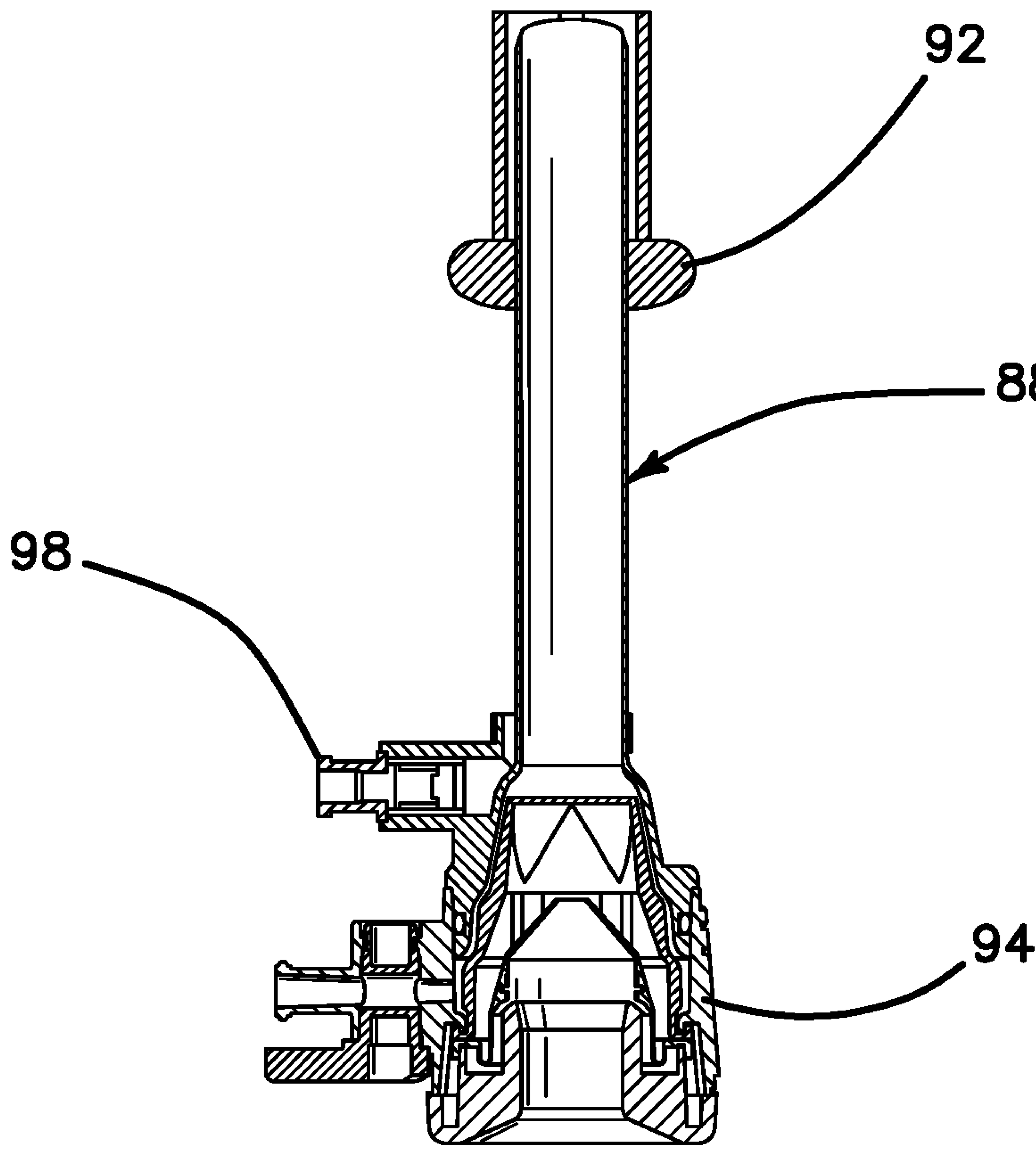


FIG. 31

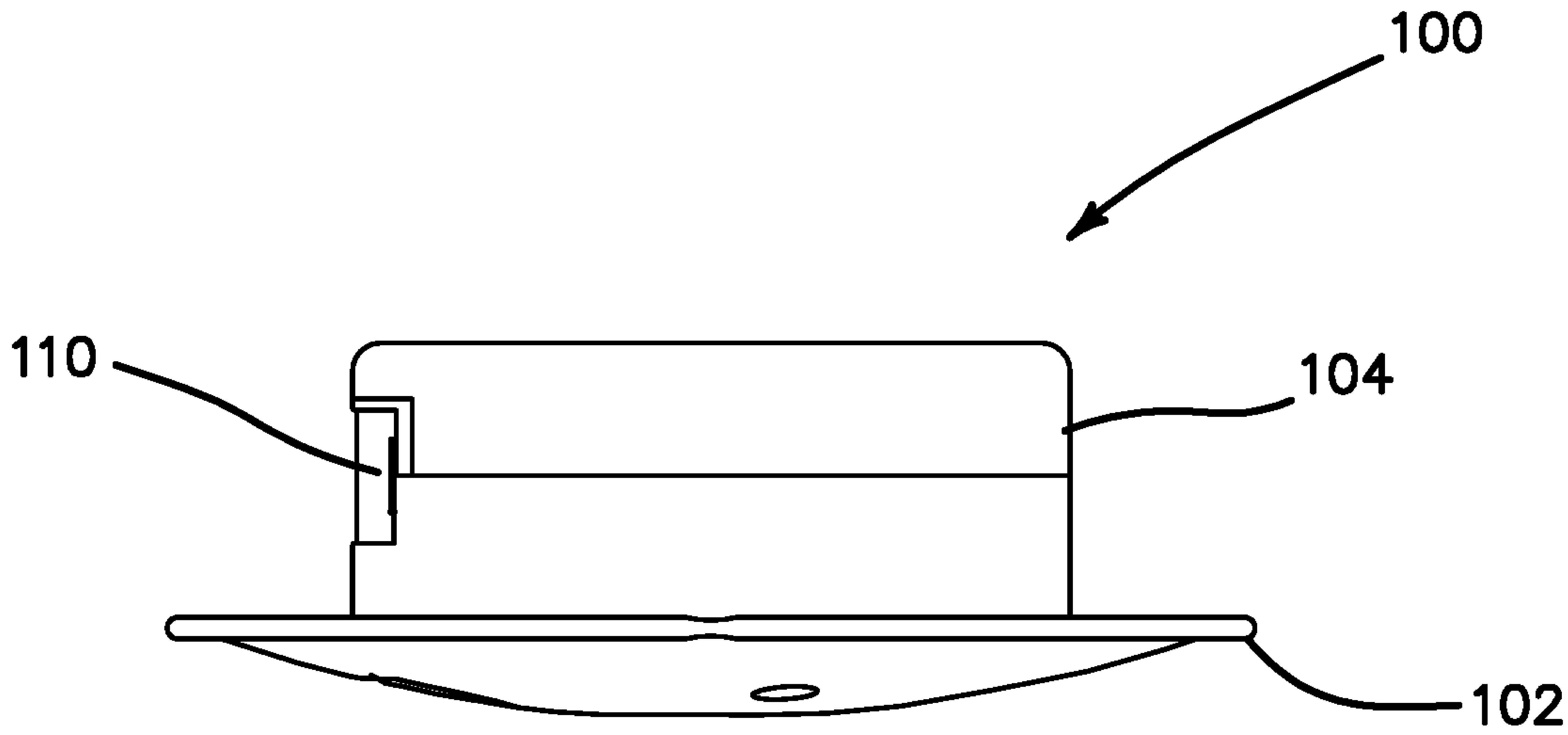


FIG. 32

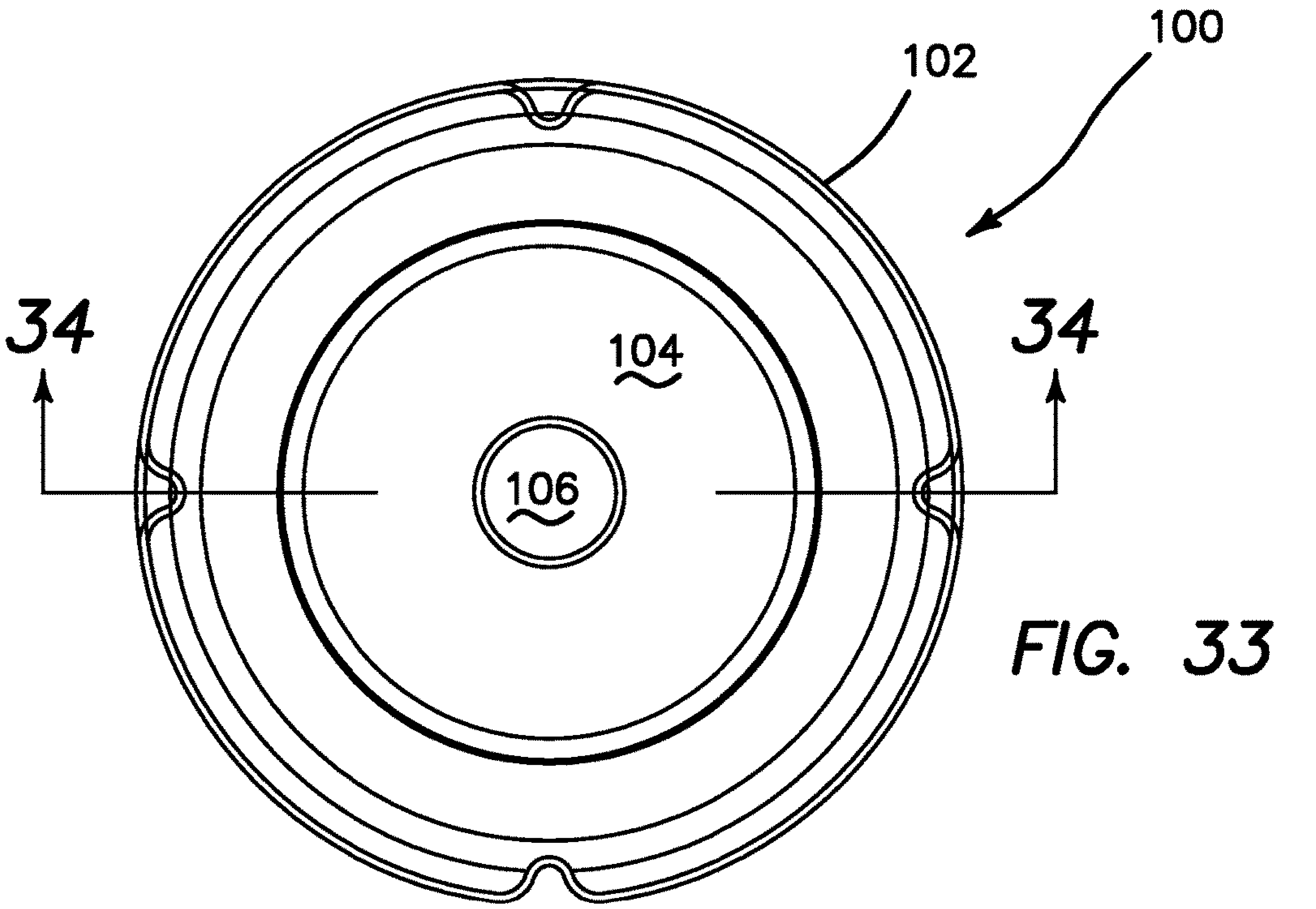


FIG. 33

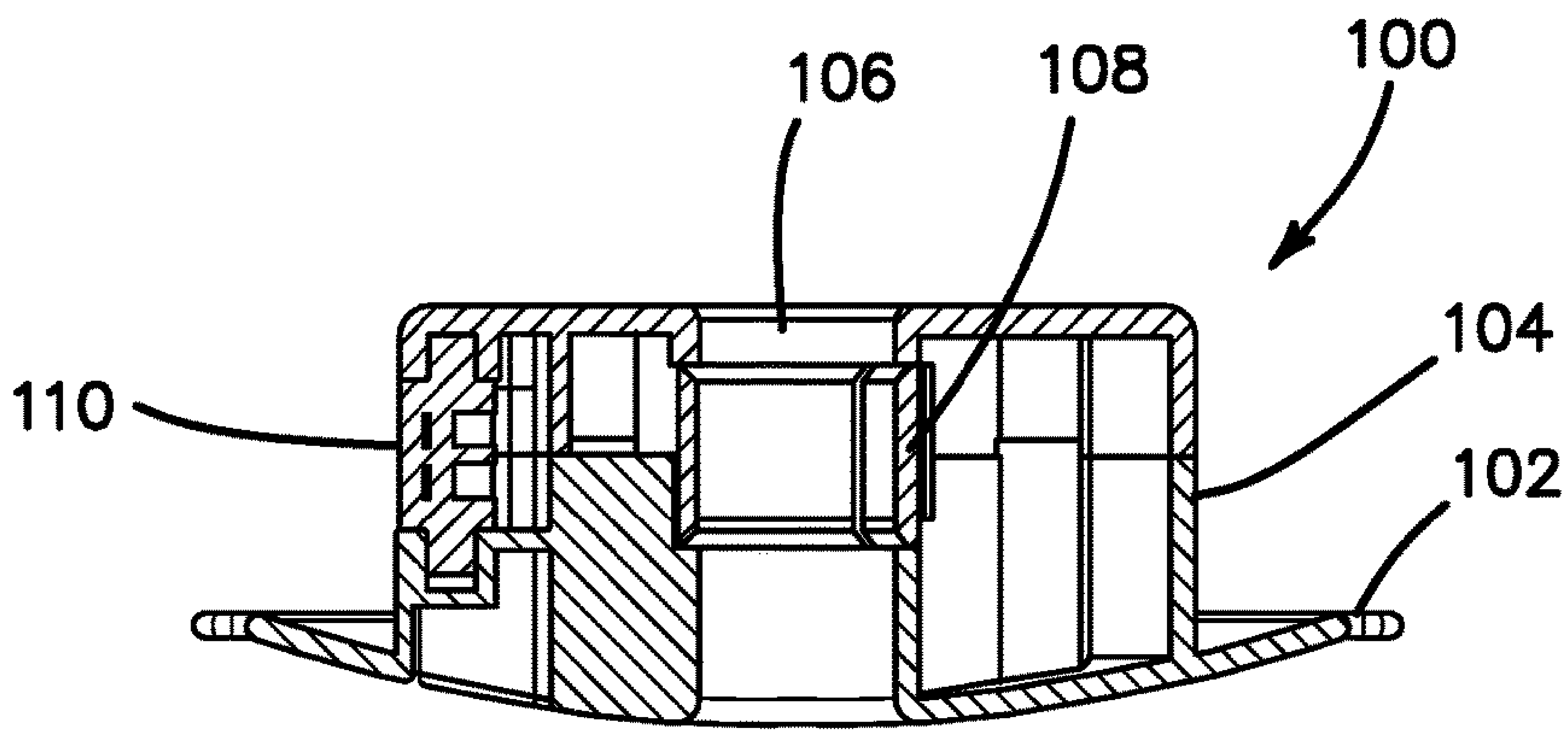


FIG. 34

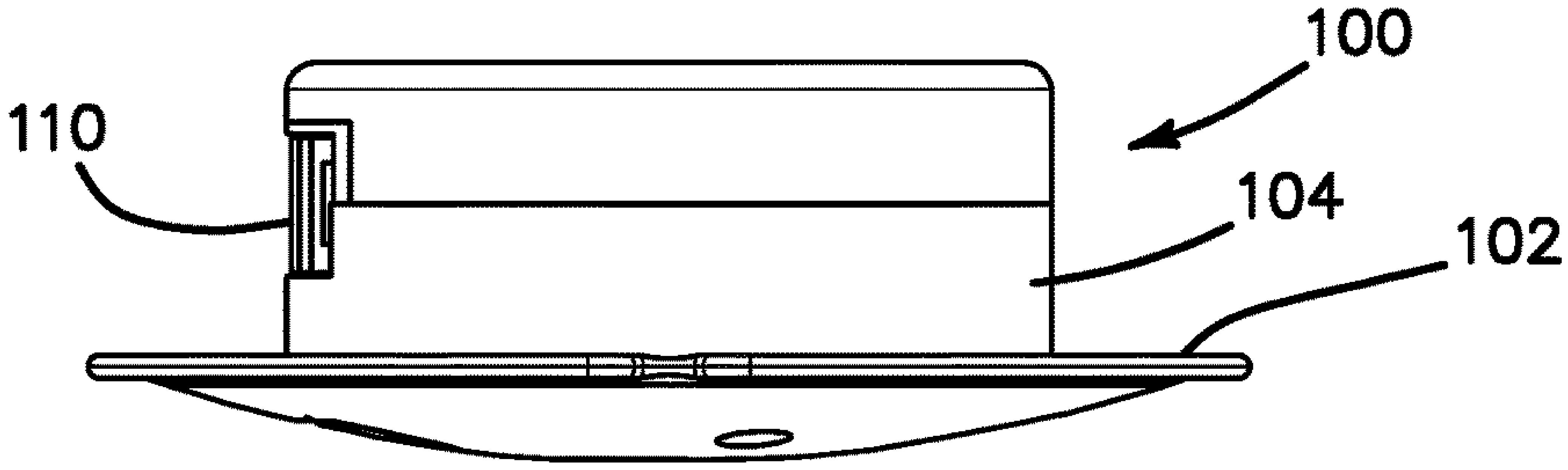


FIG. 35

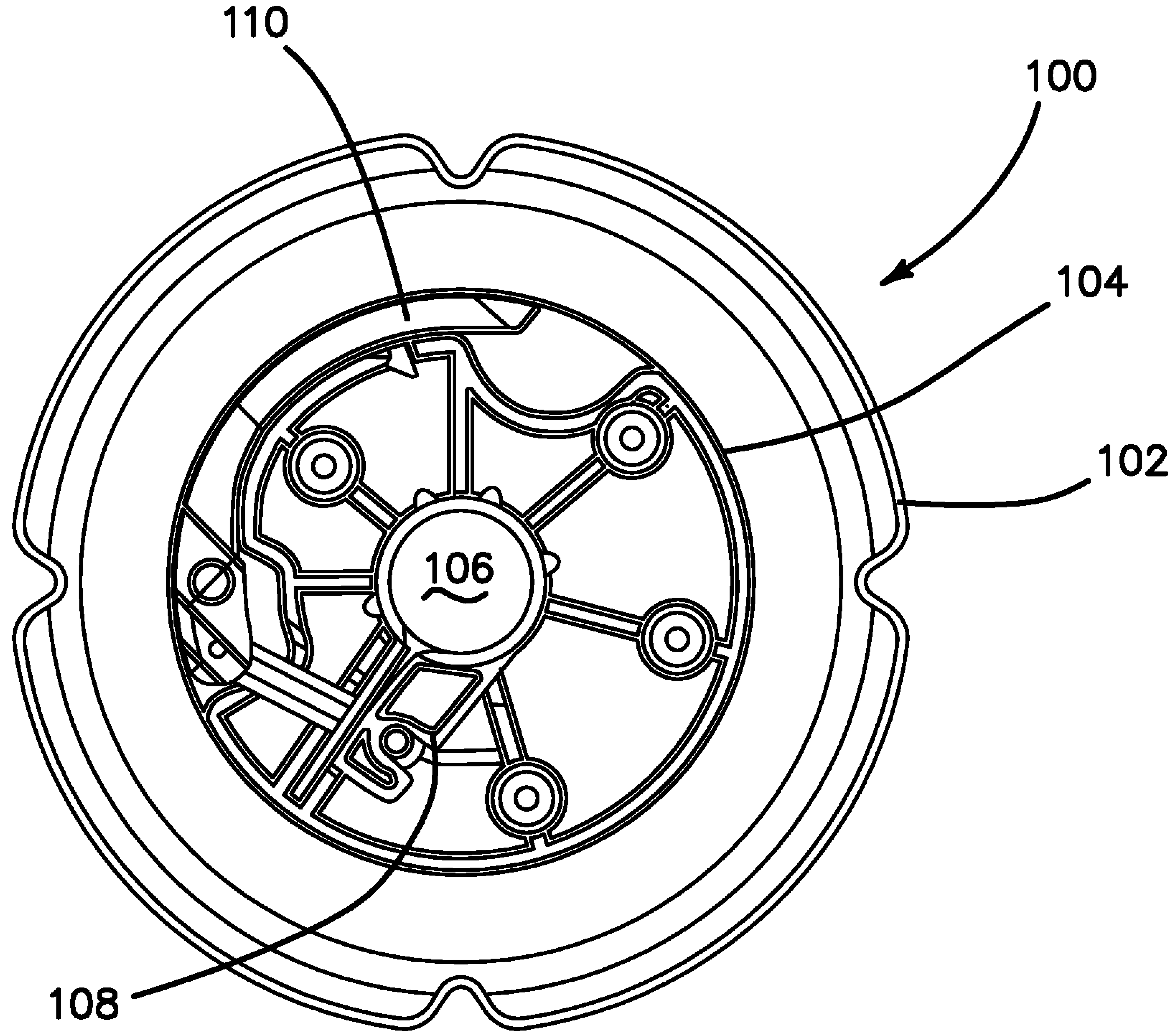


FIG. 36

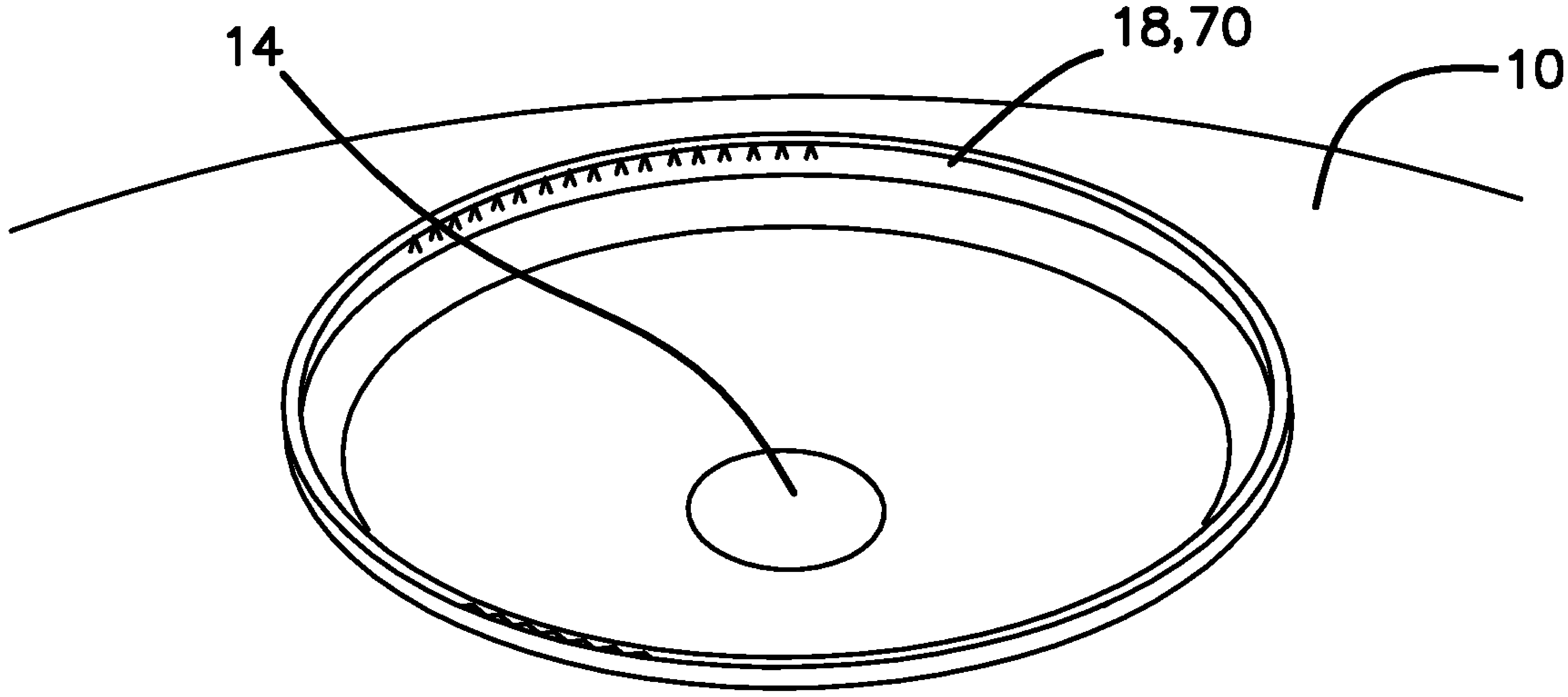


FIG. 38

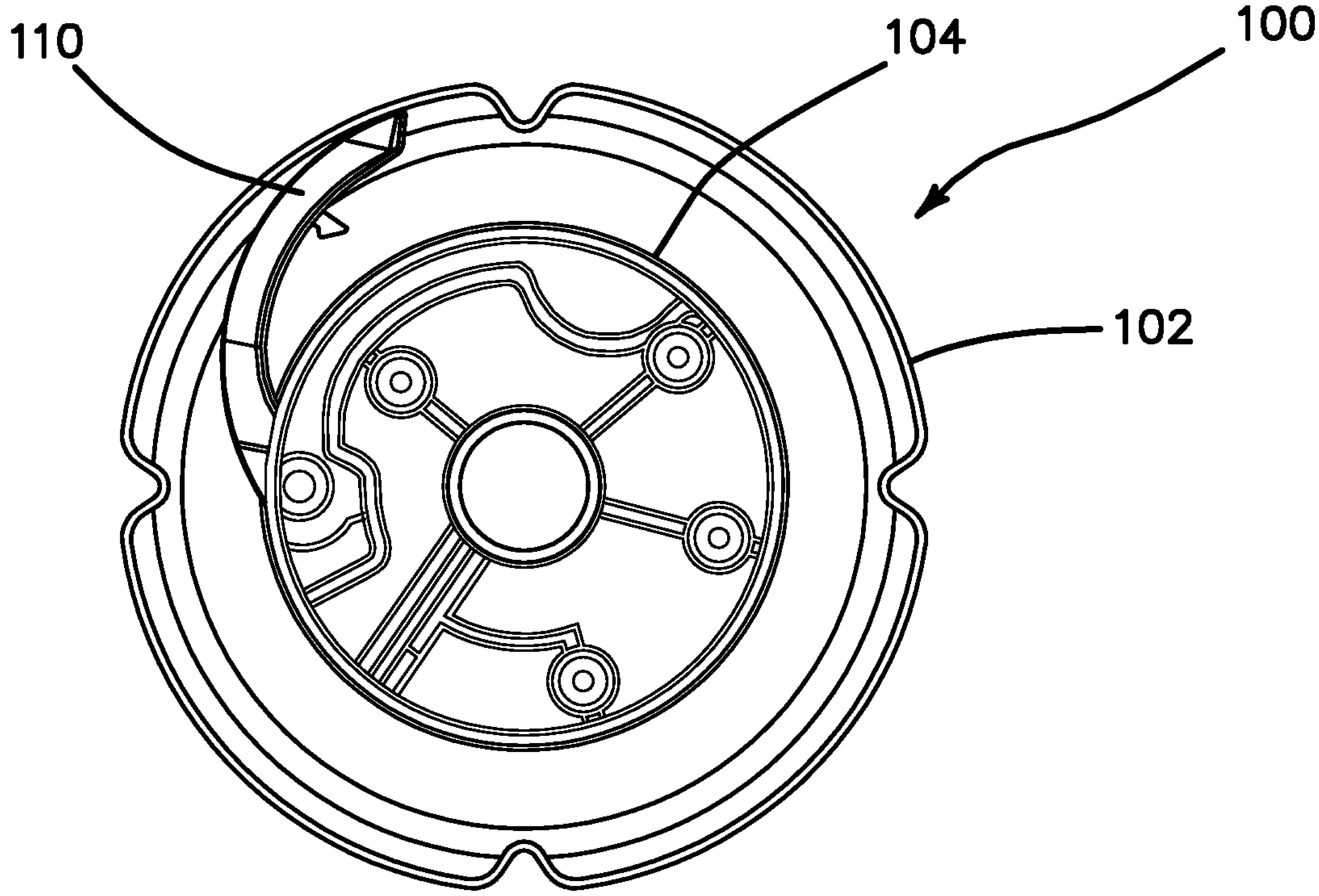


FIG. 37A

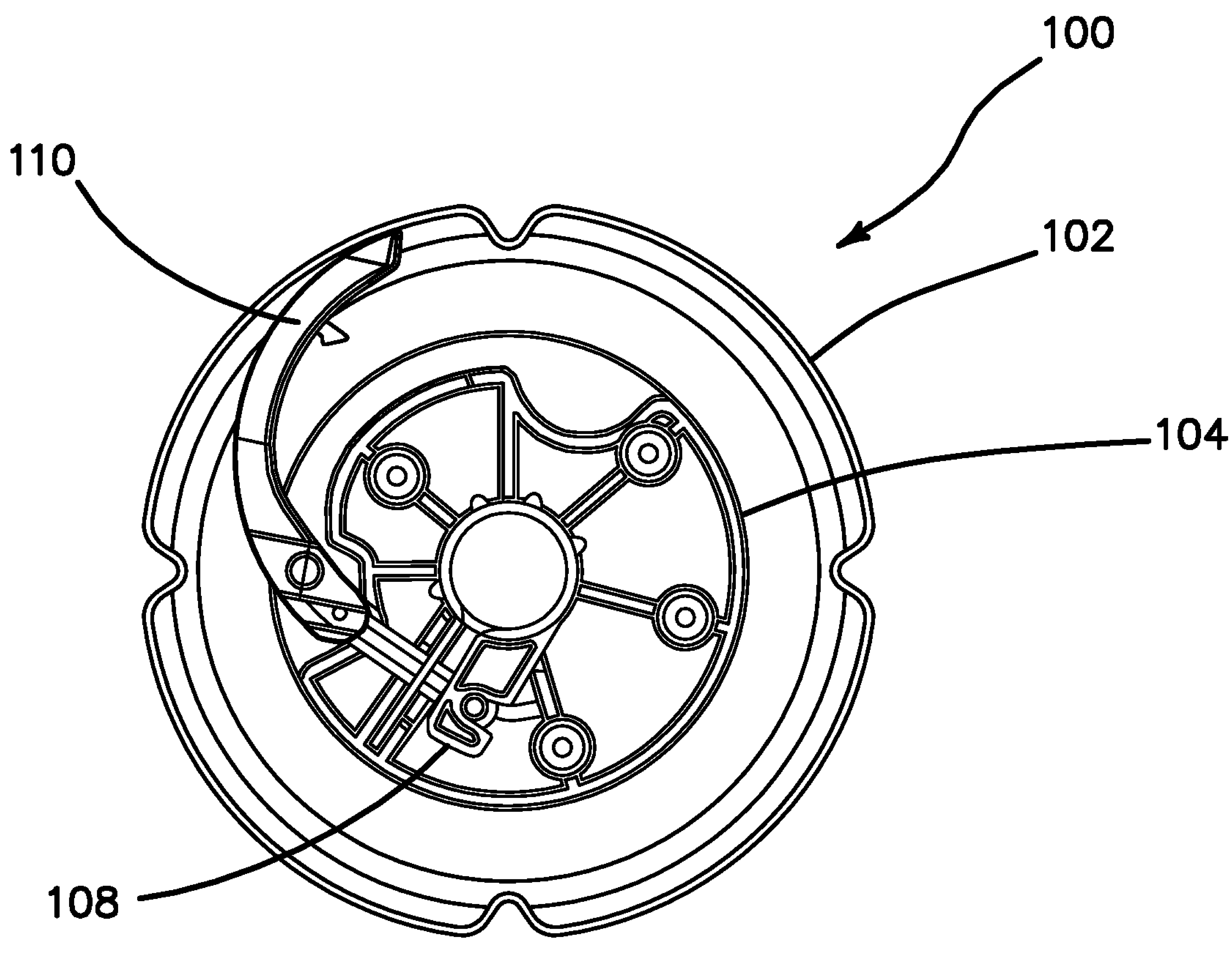


FIG. 37B

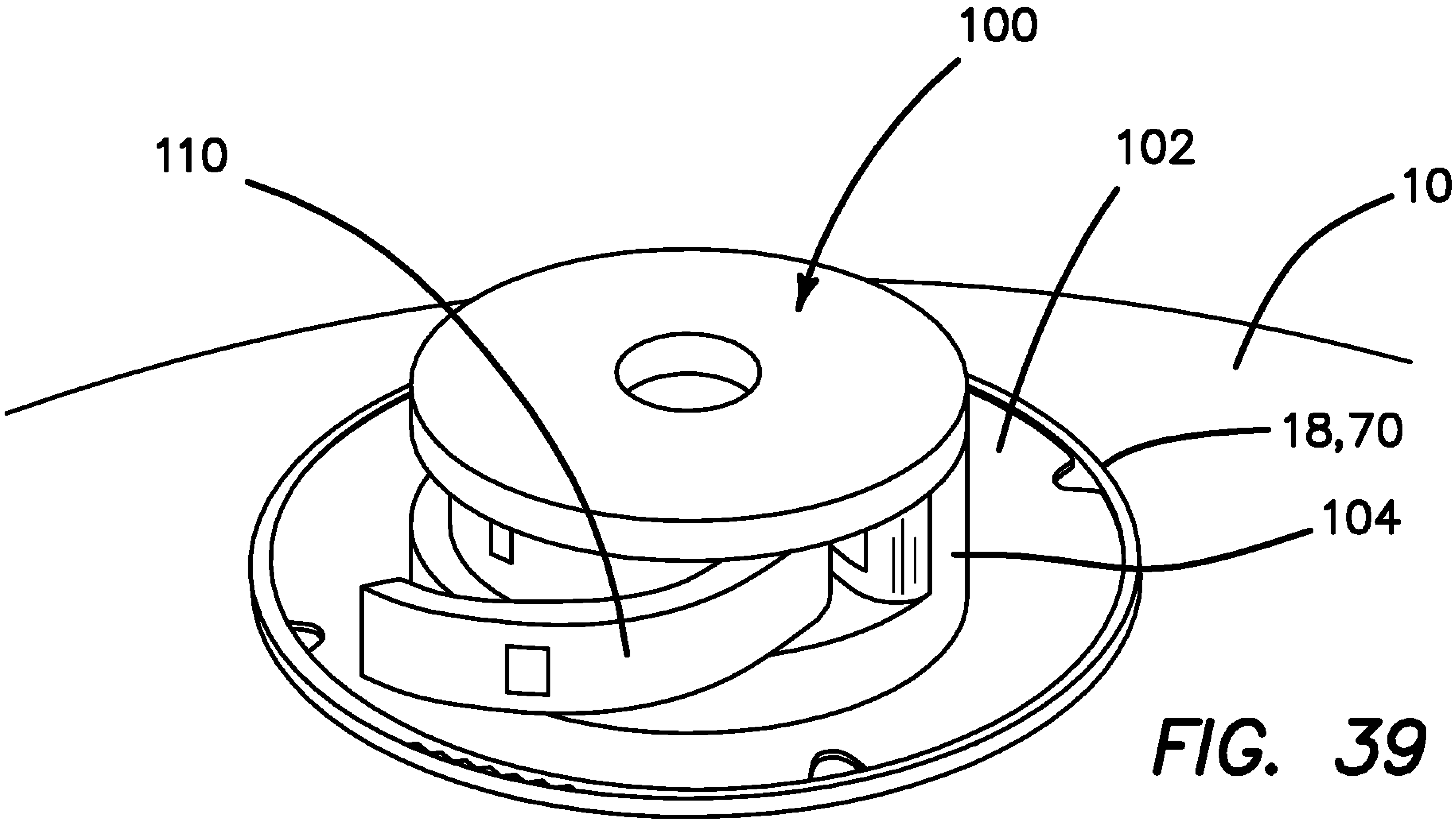


FIG. 39

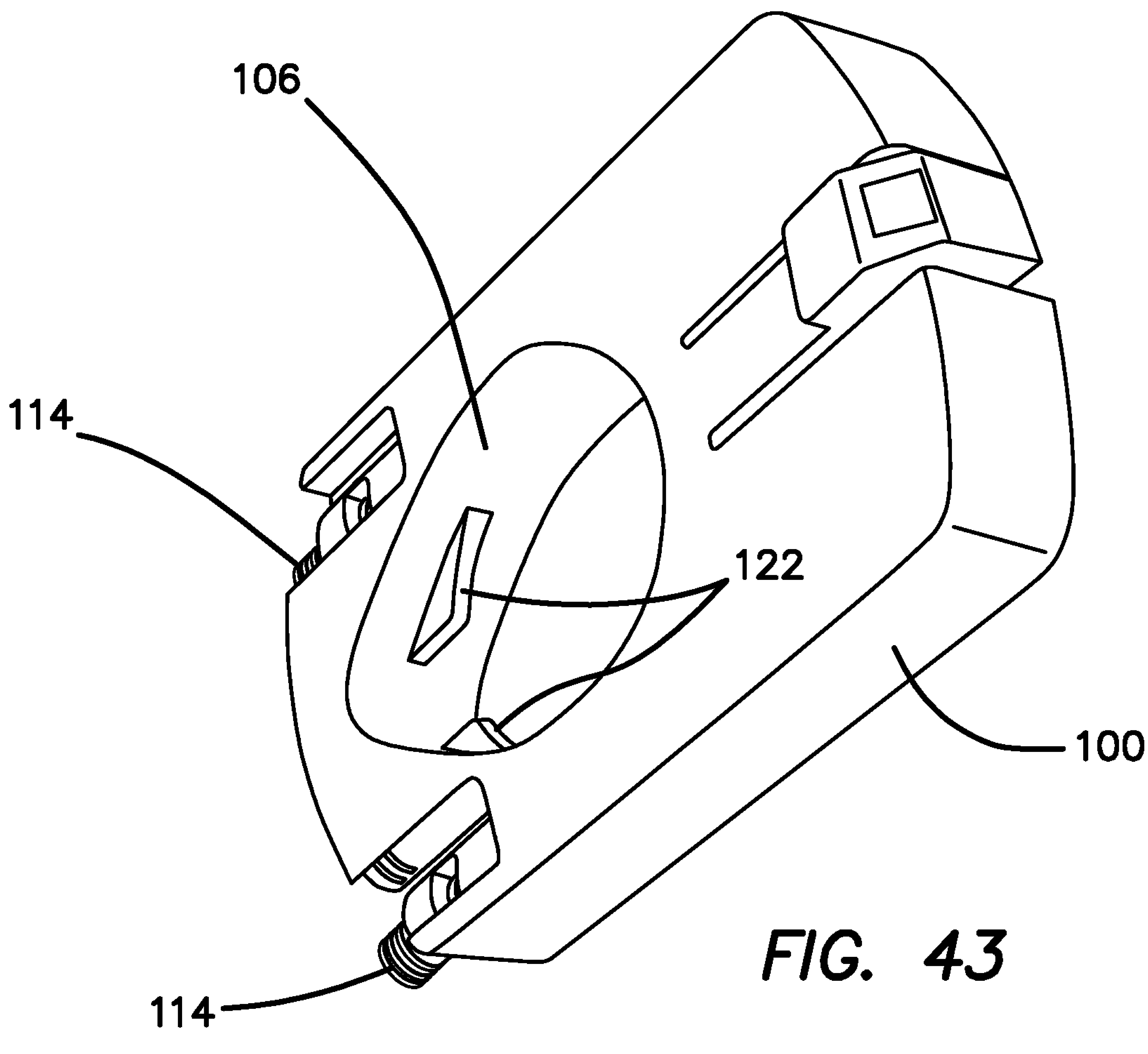


FIG. 43

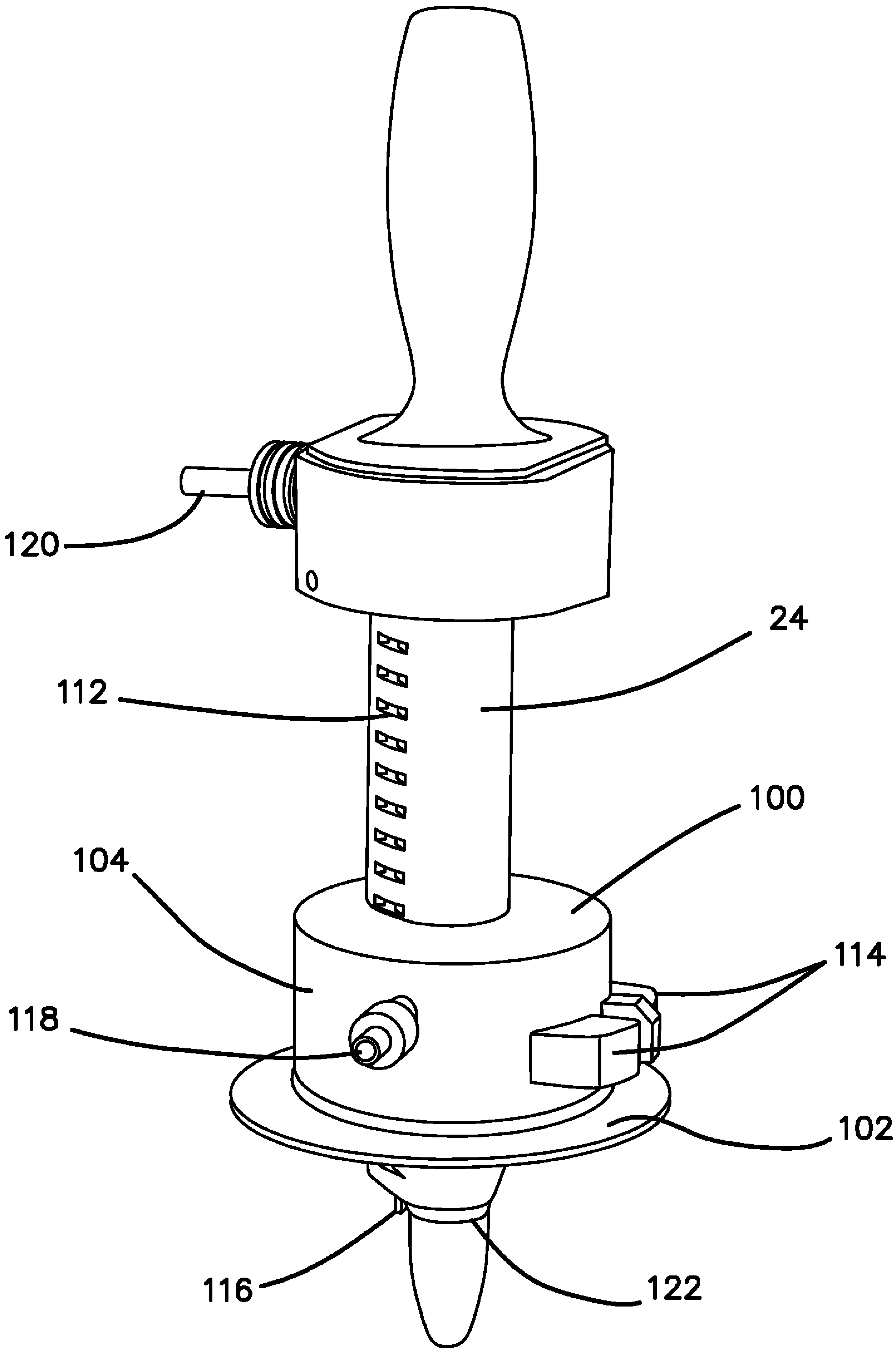


FIG. 40

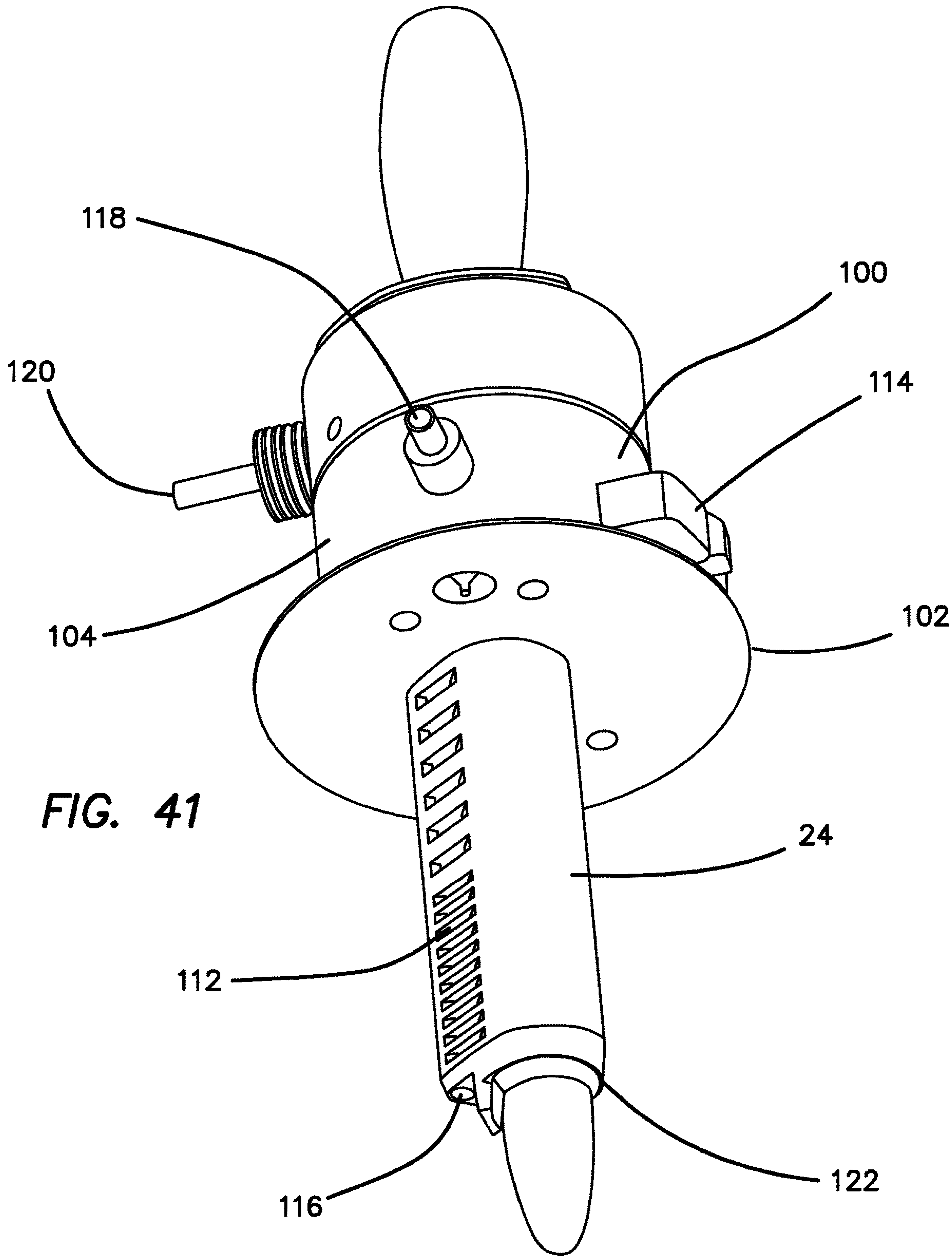


FIG. 41

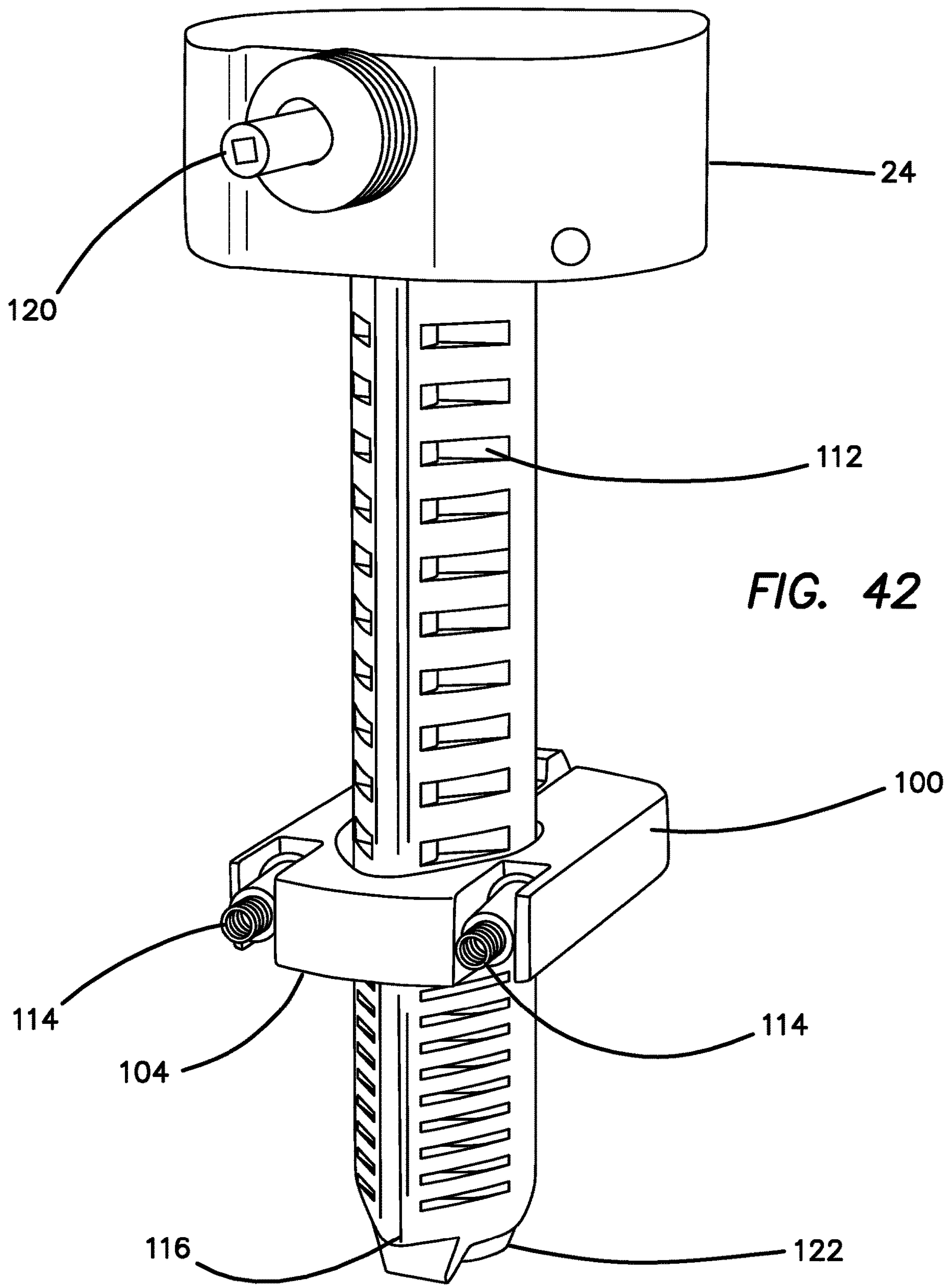


FIG. 42

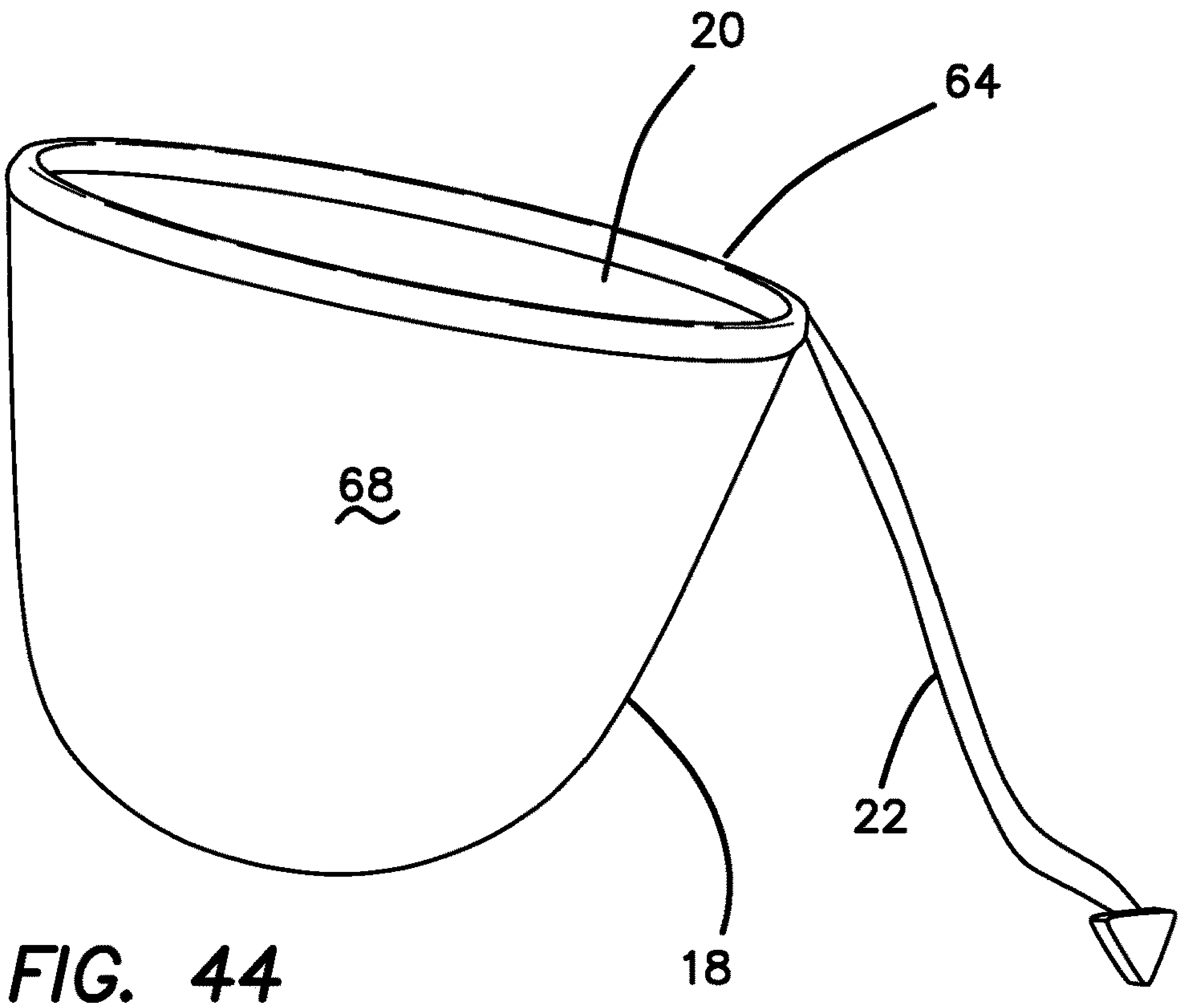


FIG. 44

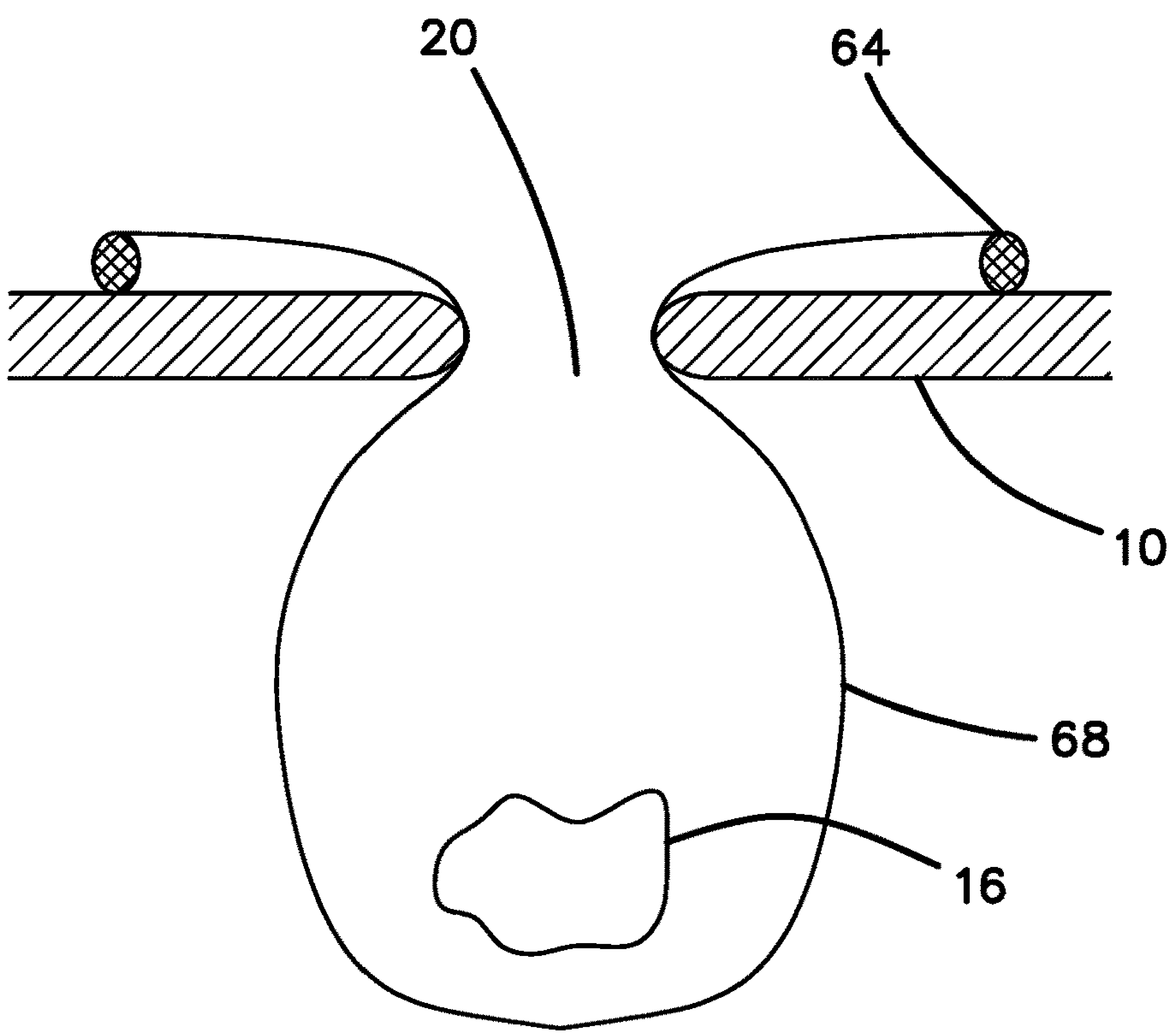


FIG. 45

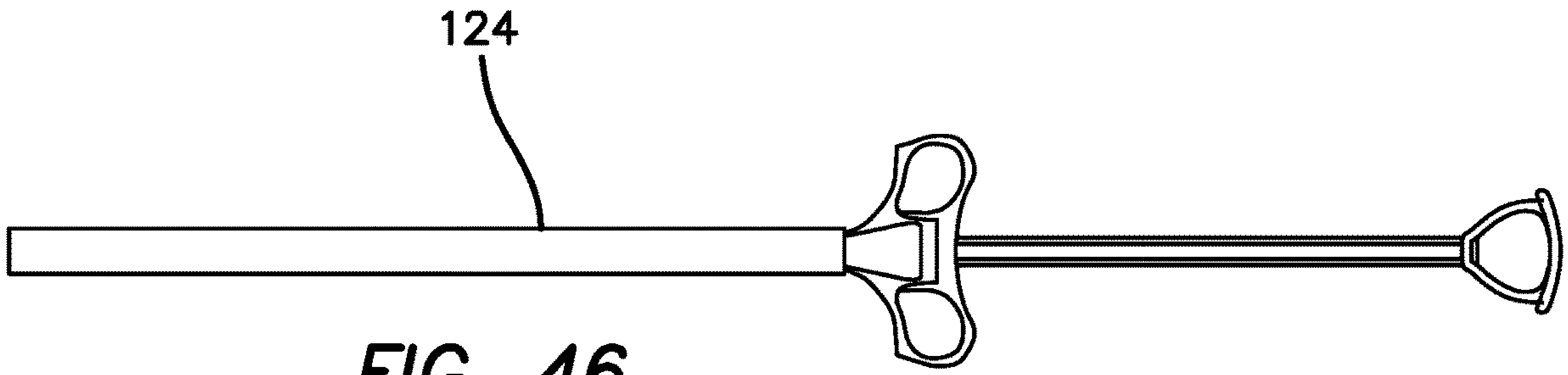


FIG. 46

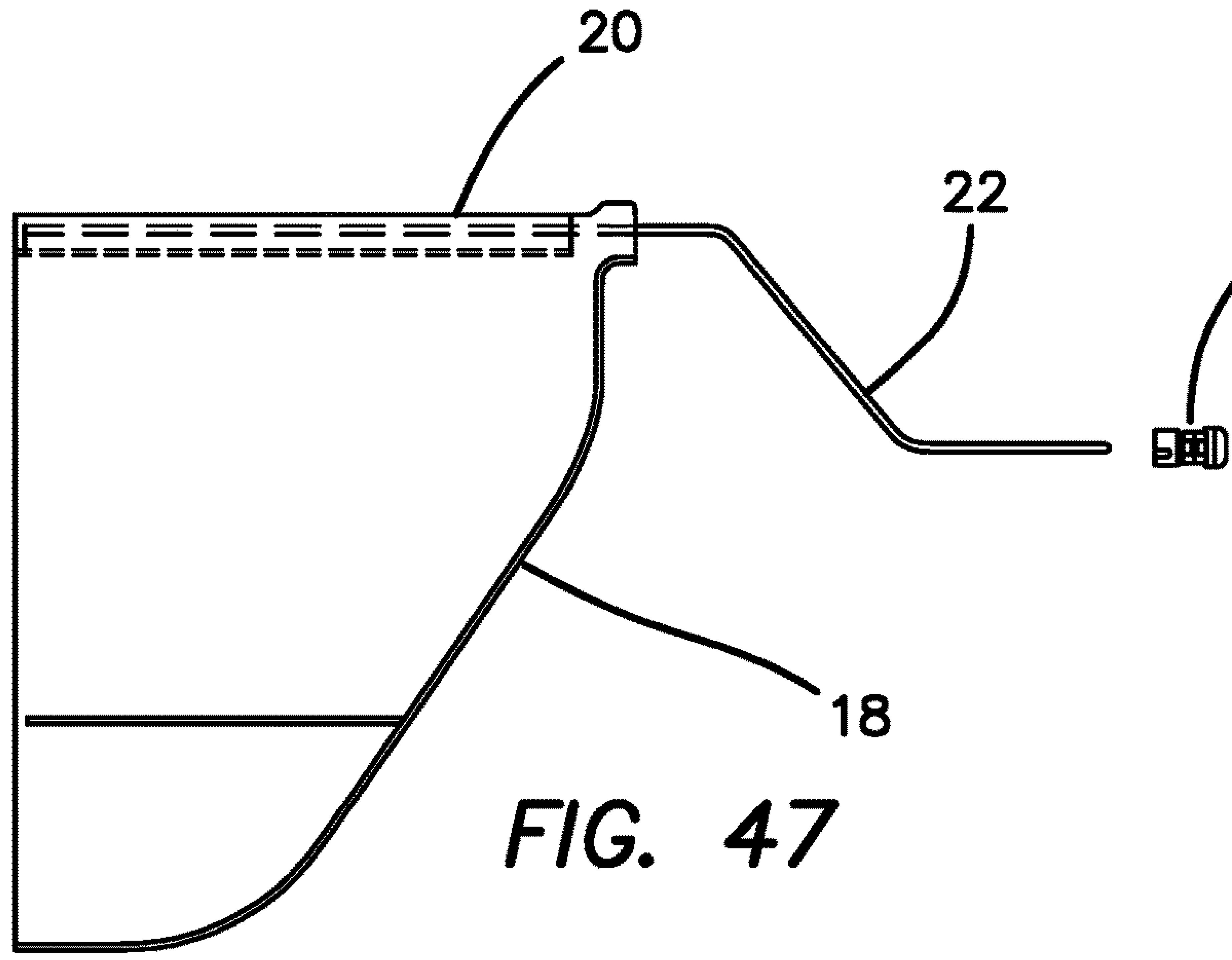


FIG. 47

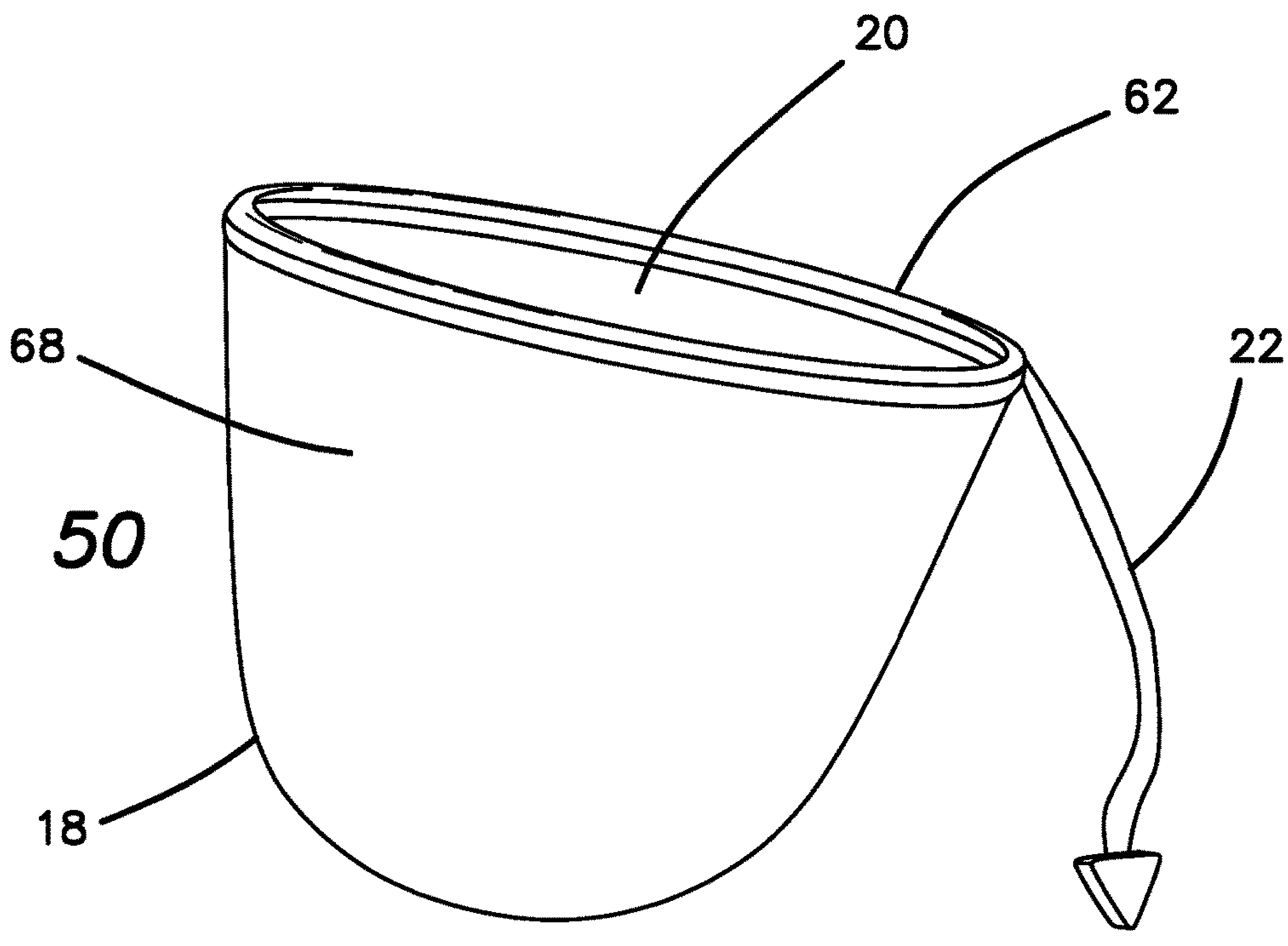


FIG. 50

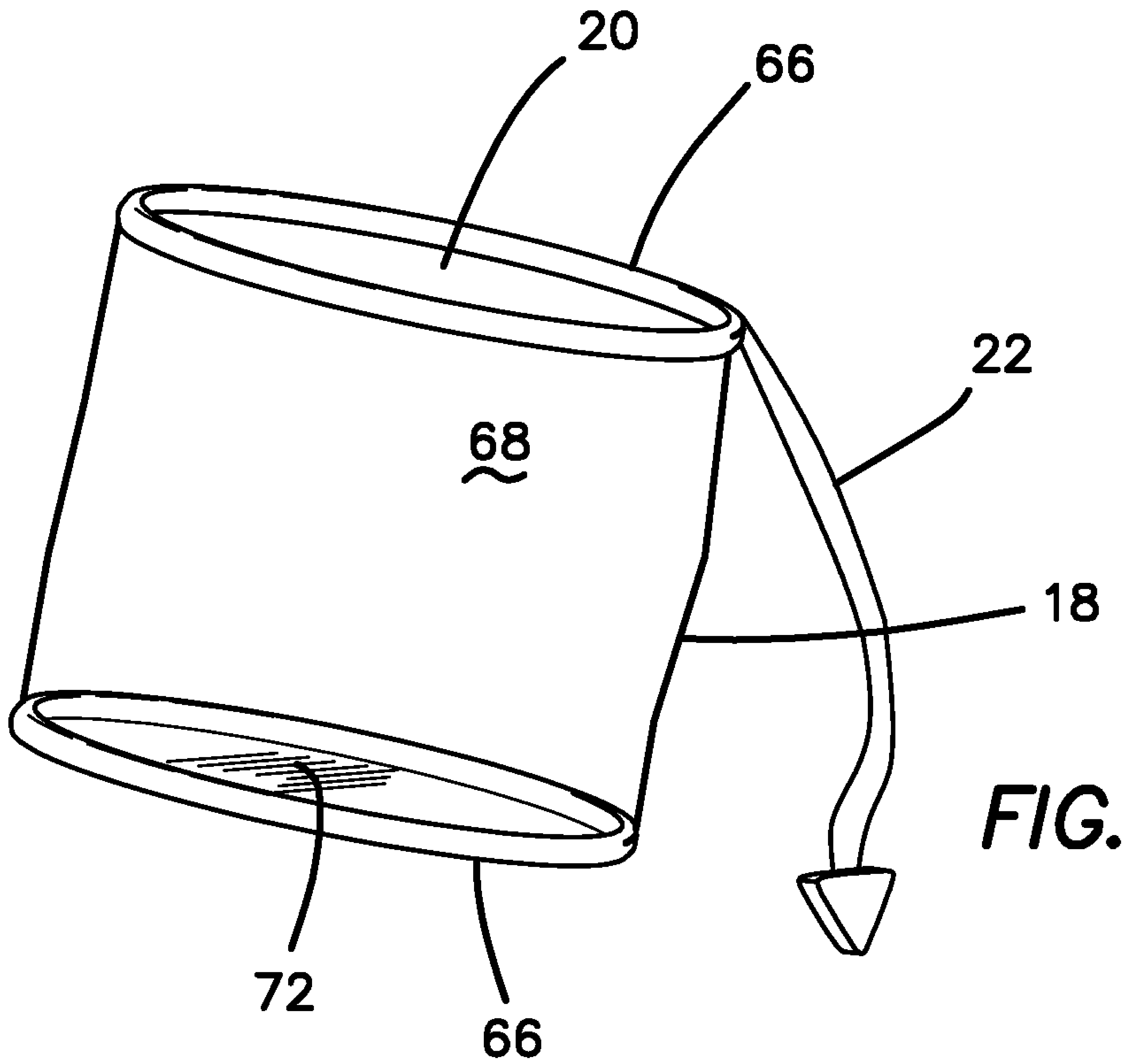


FIG. 48

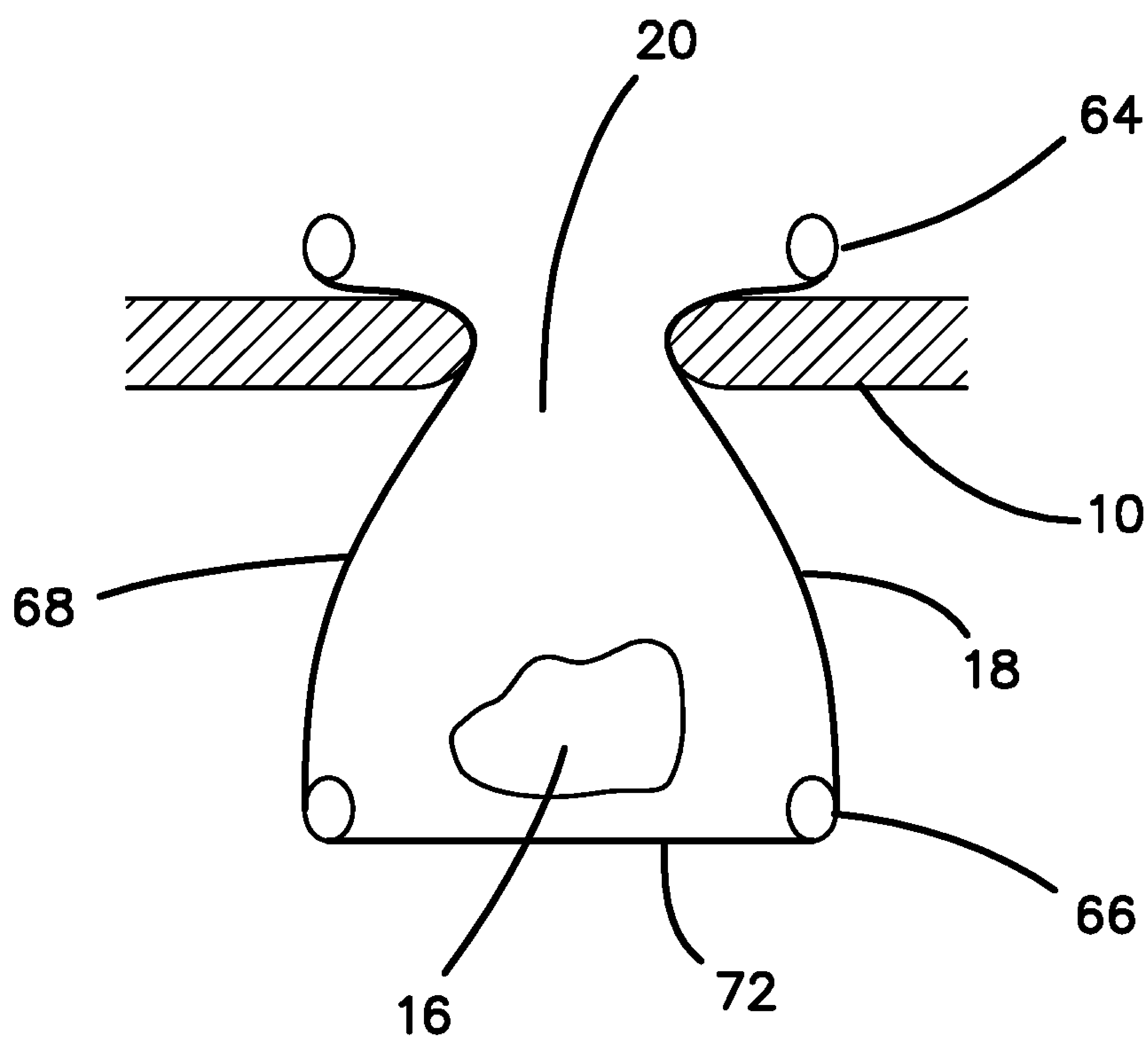
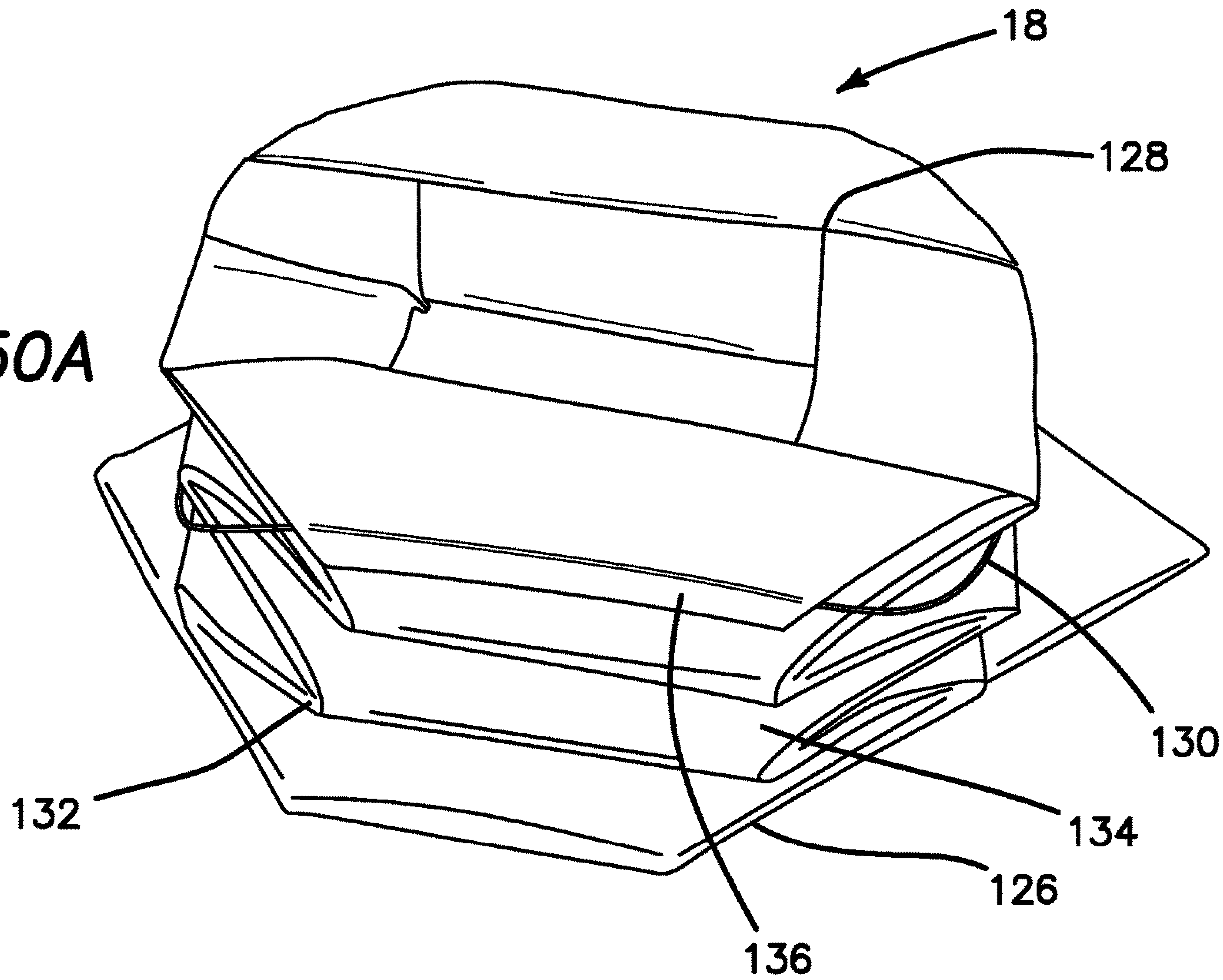


FIG. 49

FIG. 50A



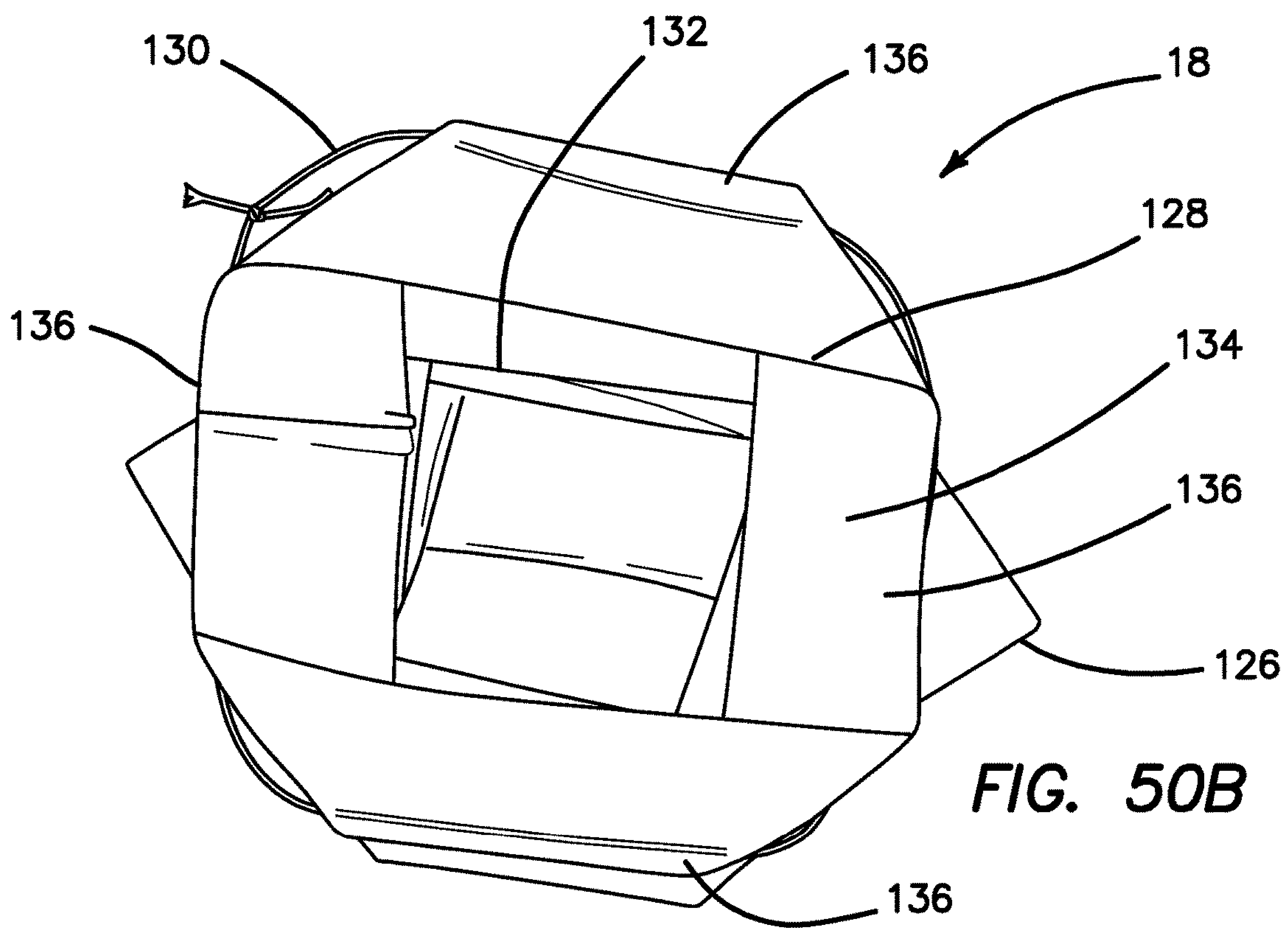
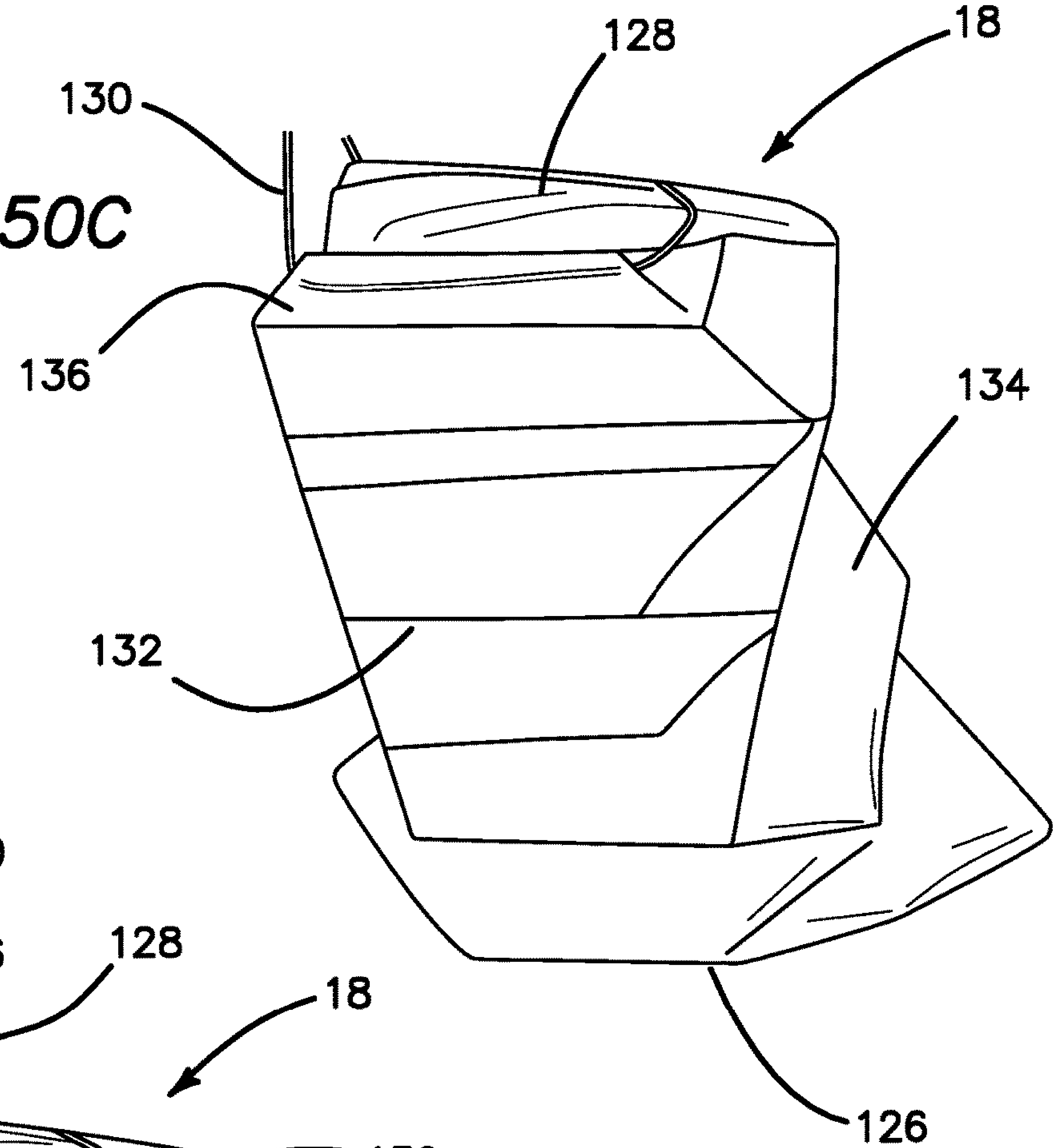


FIG. 50B

FIG. 50C



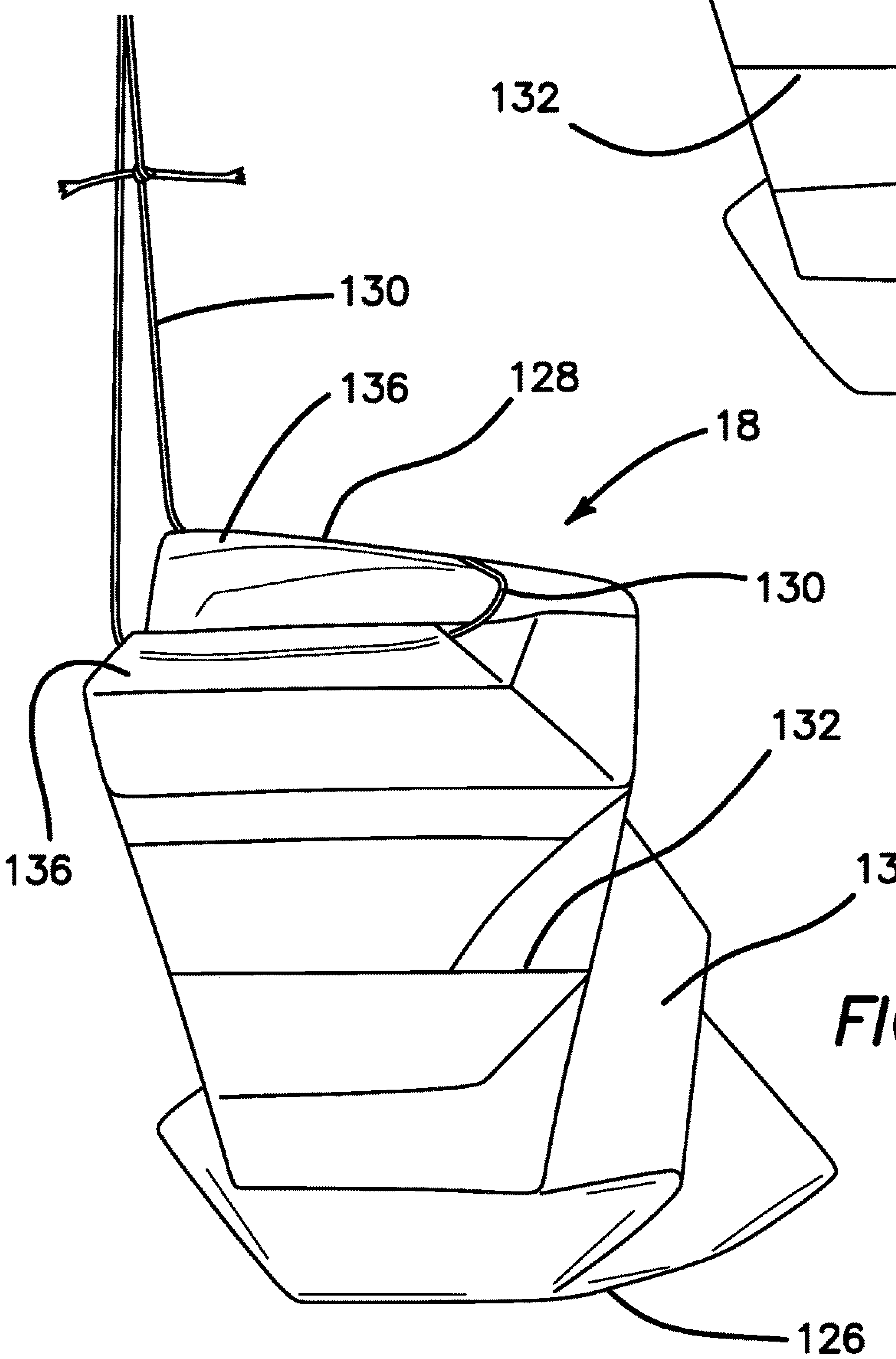


FIG. 50D

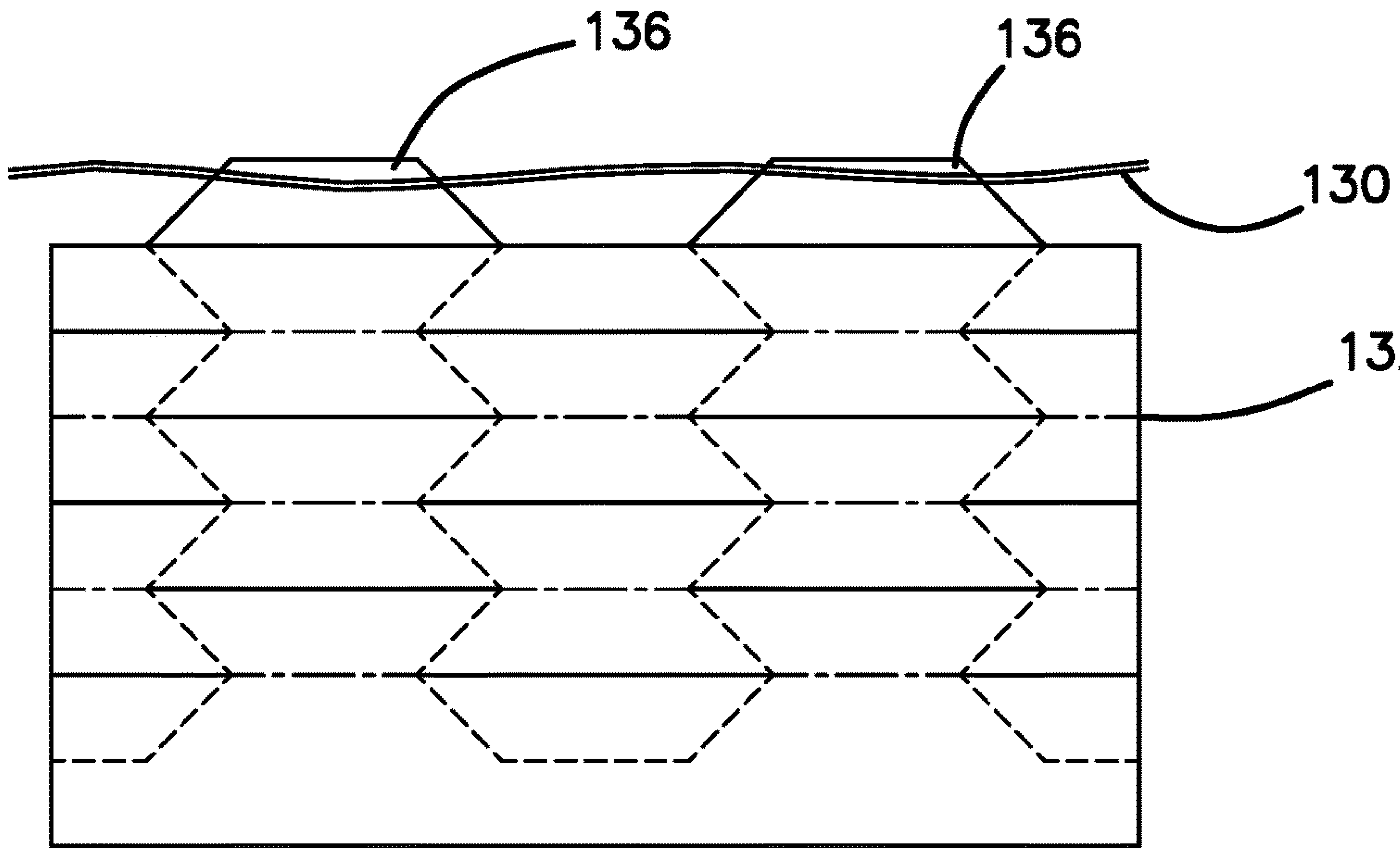


FIG. 50E

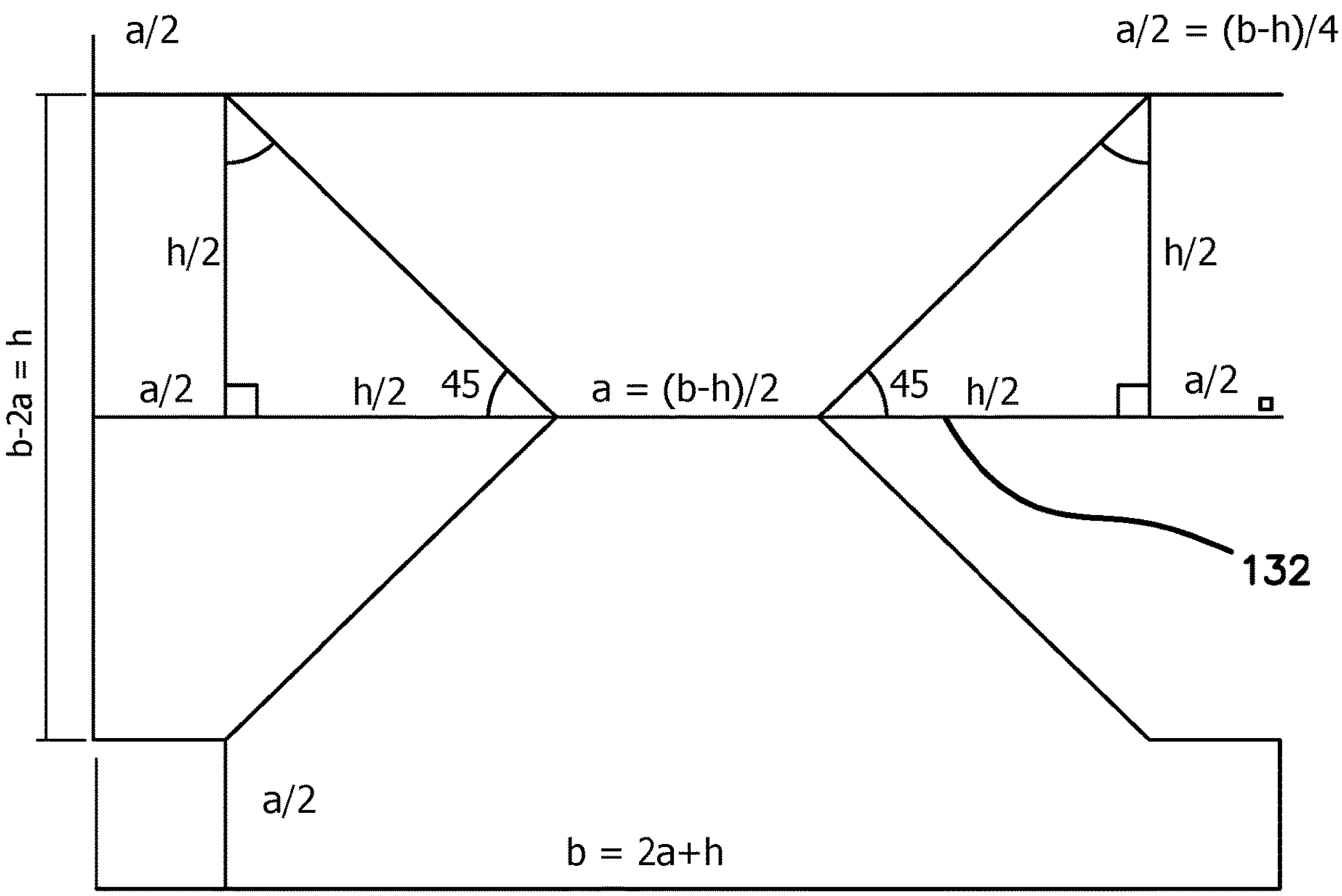


FIG. 50F

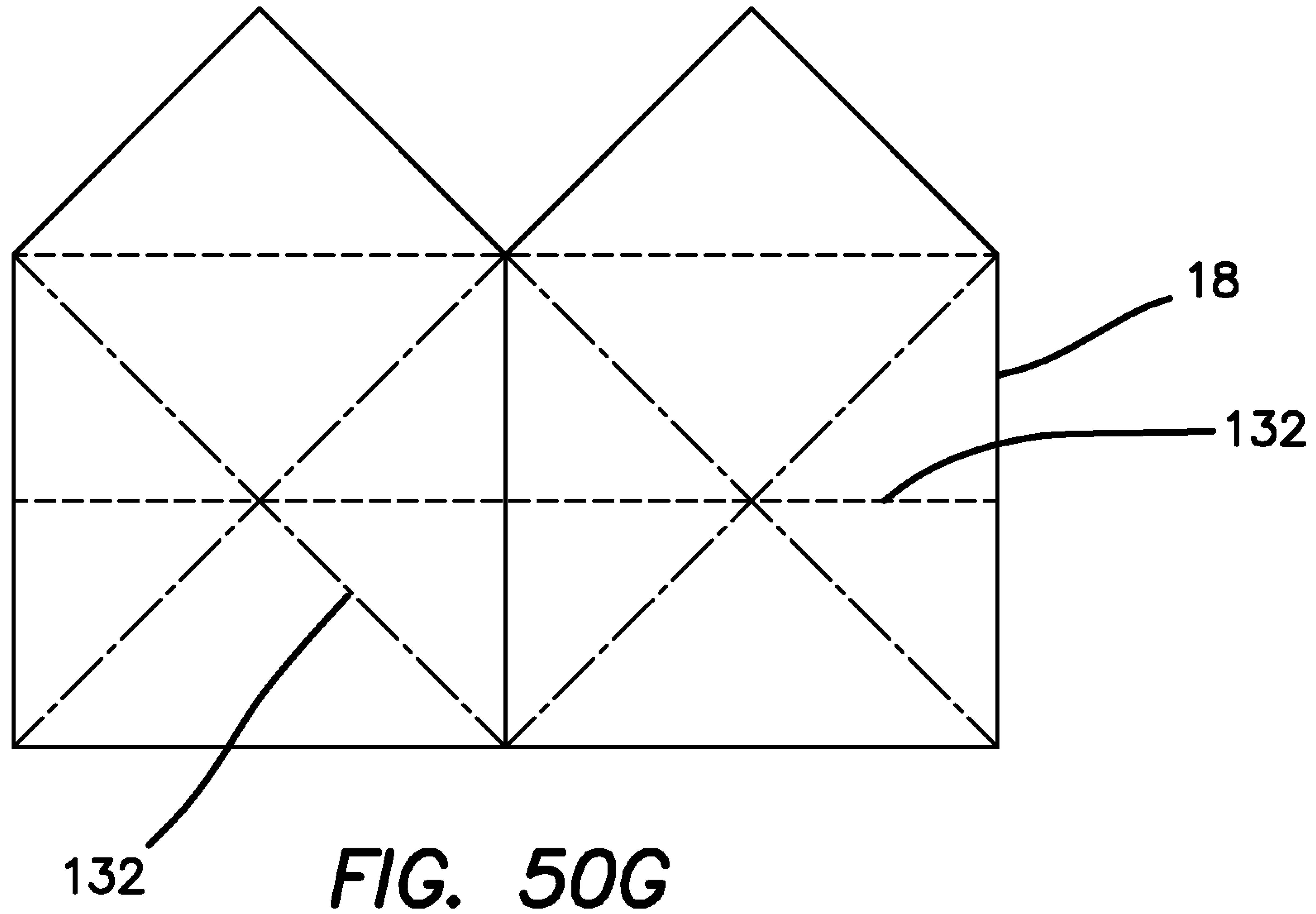


FIG. 50G

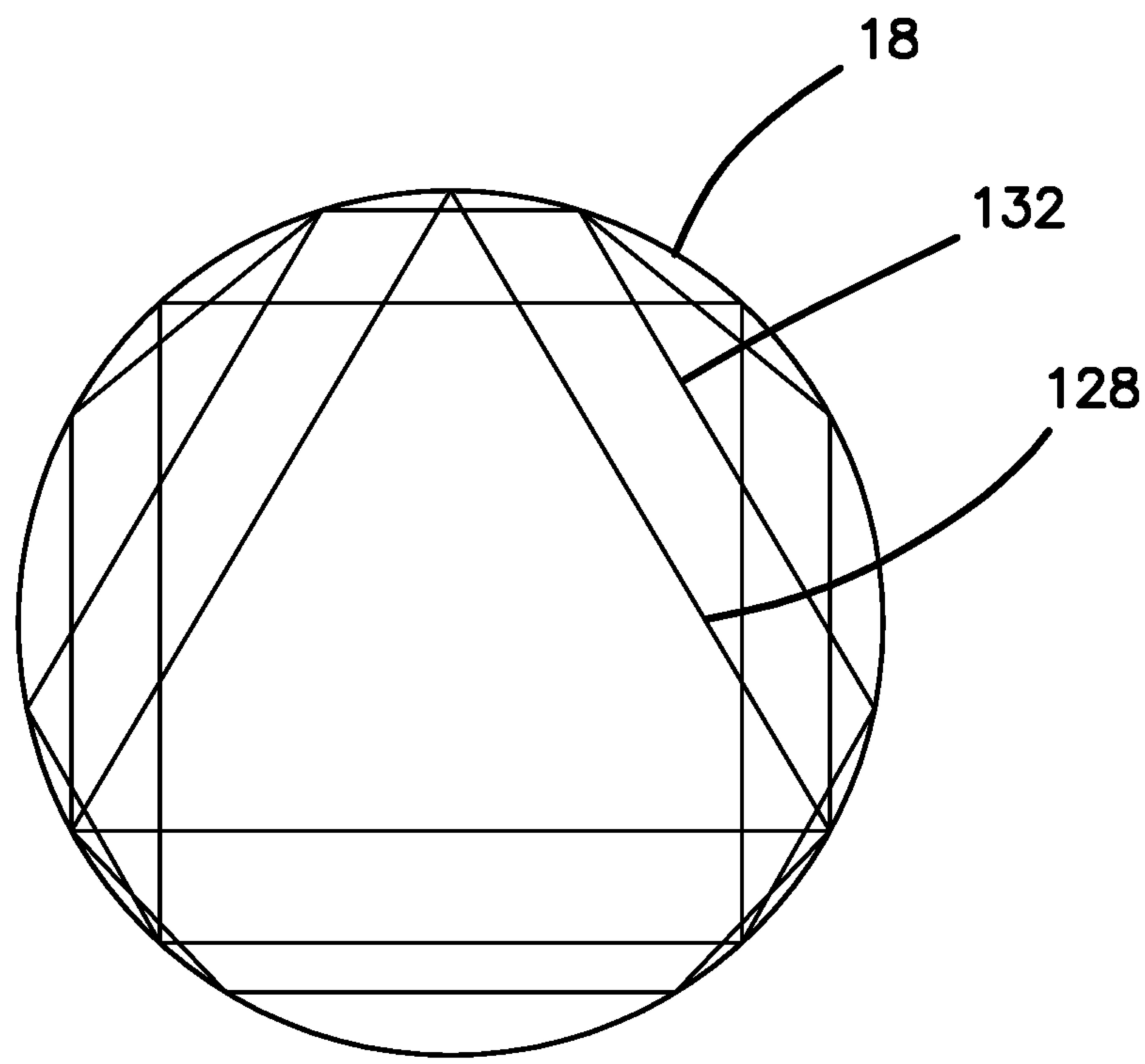


FIG. 50H

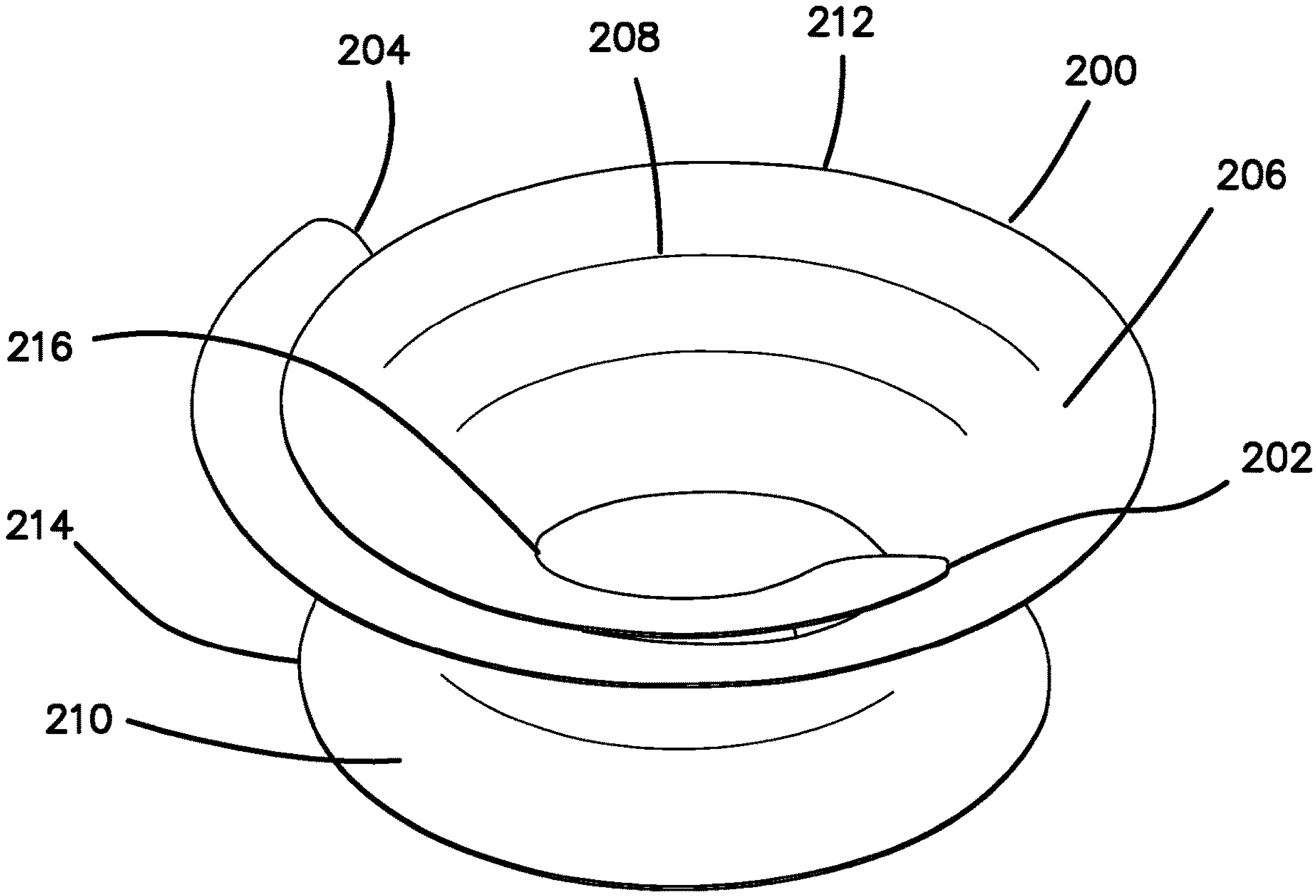

204
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FIG. 51

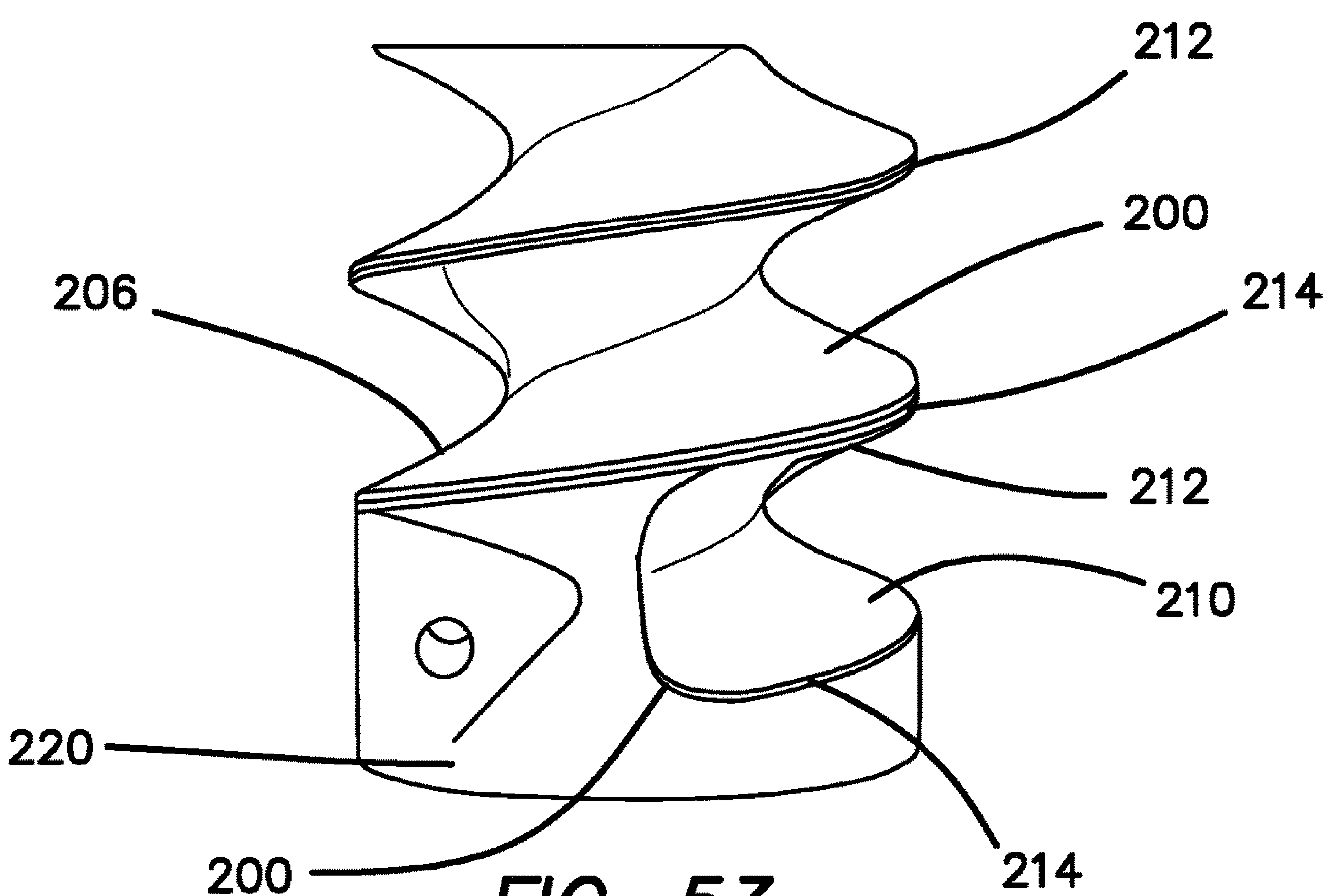
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FIG. 53

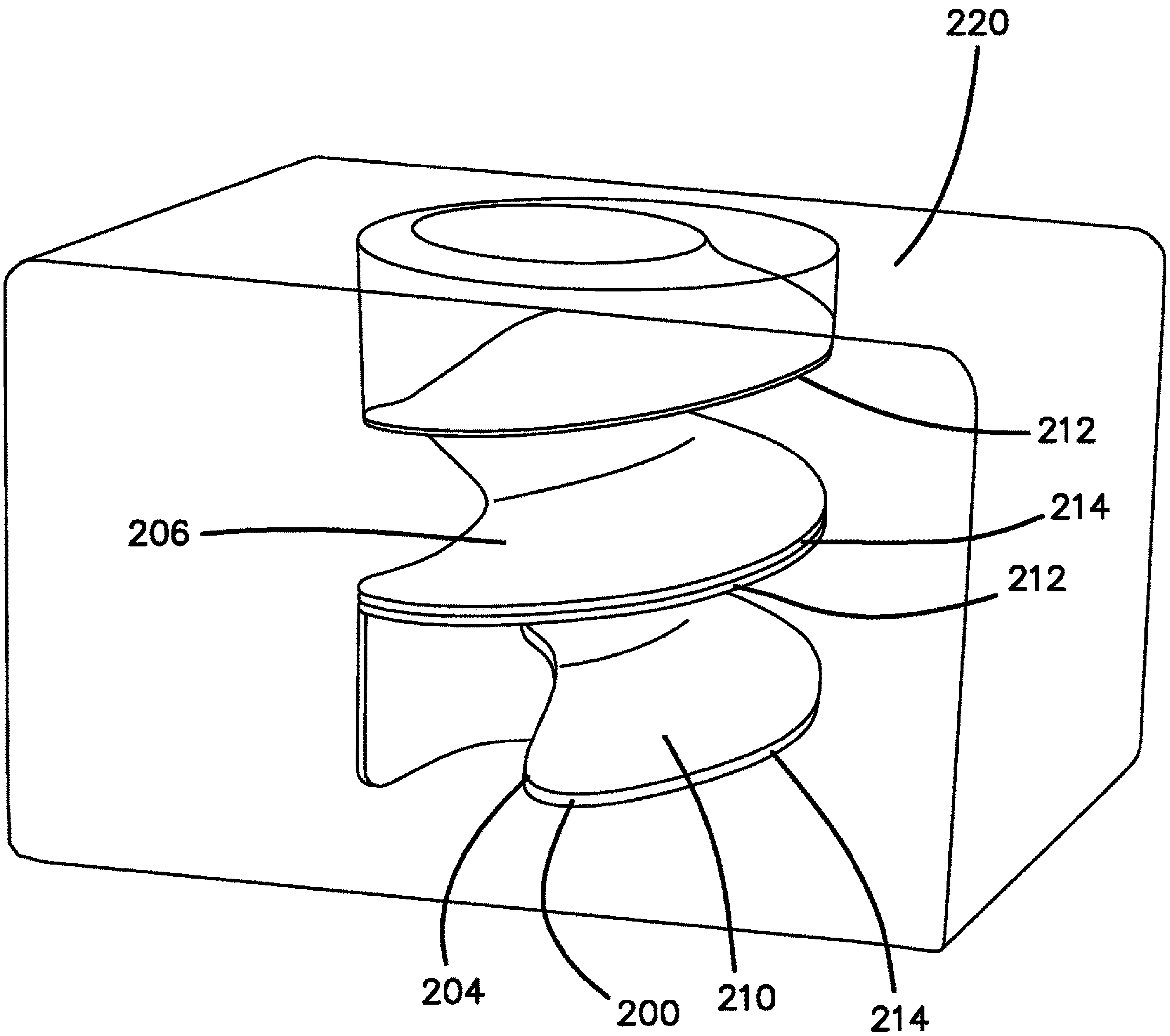

FIG. 52

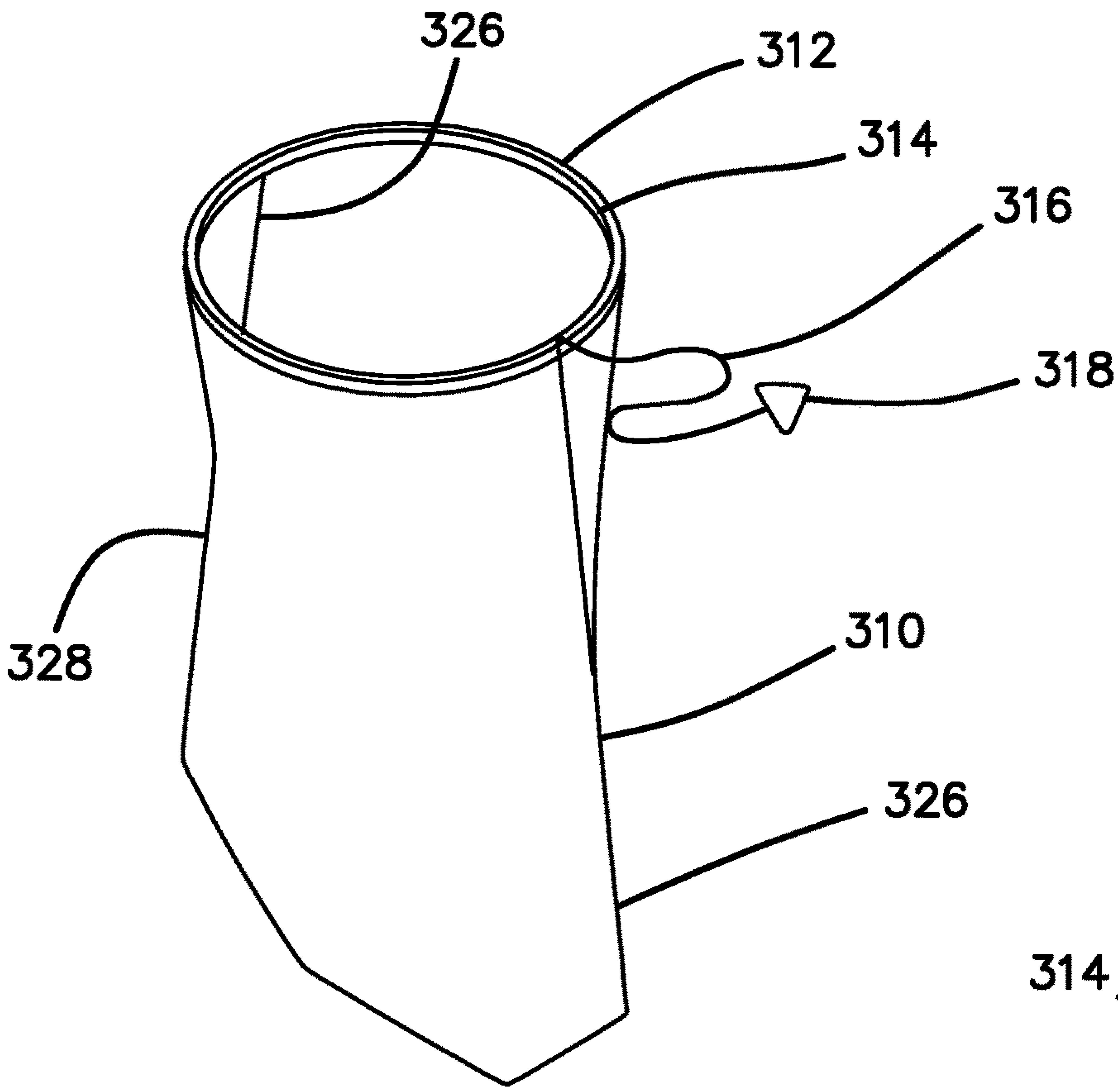

FIG. 54

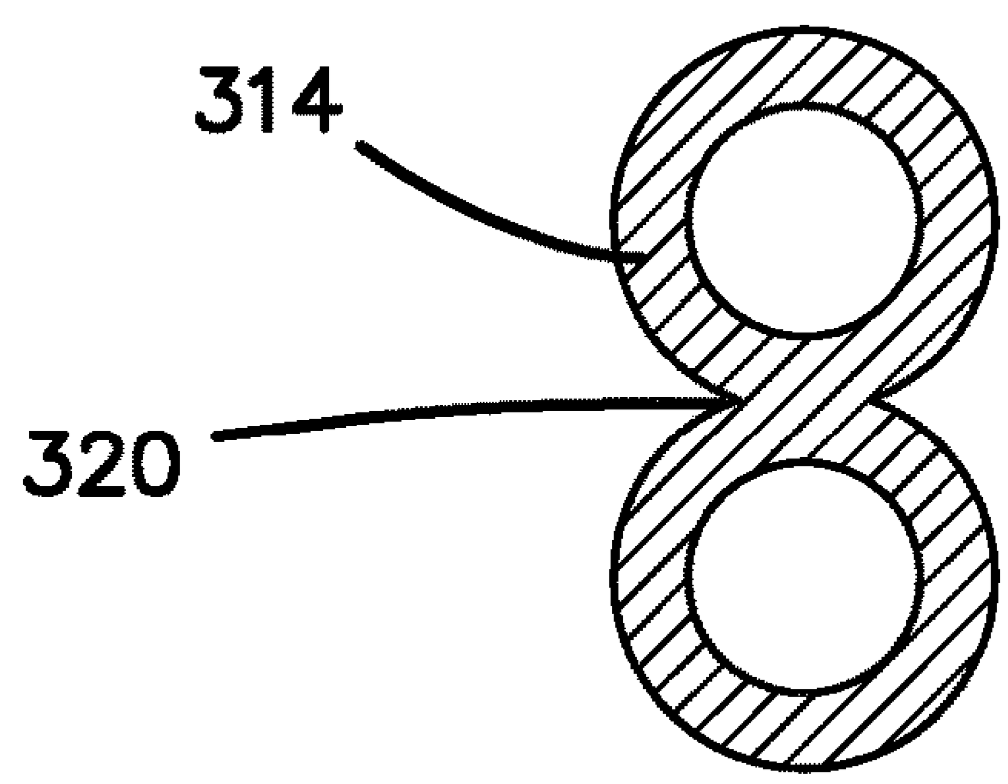

FIG. 55B

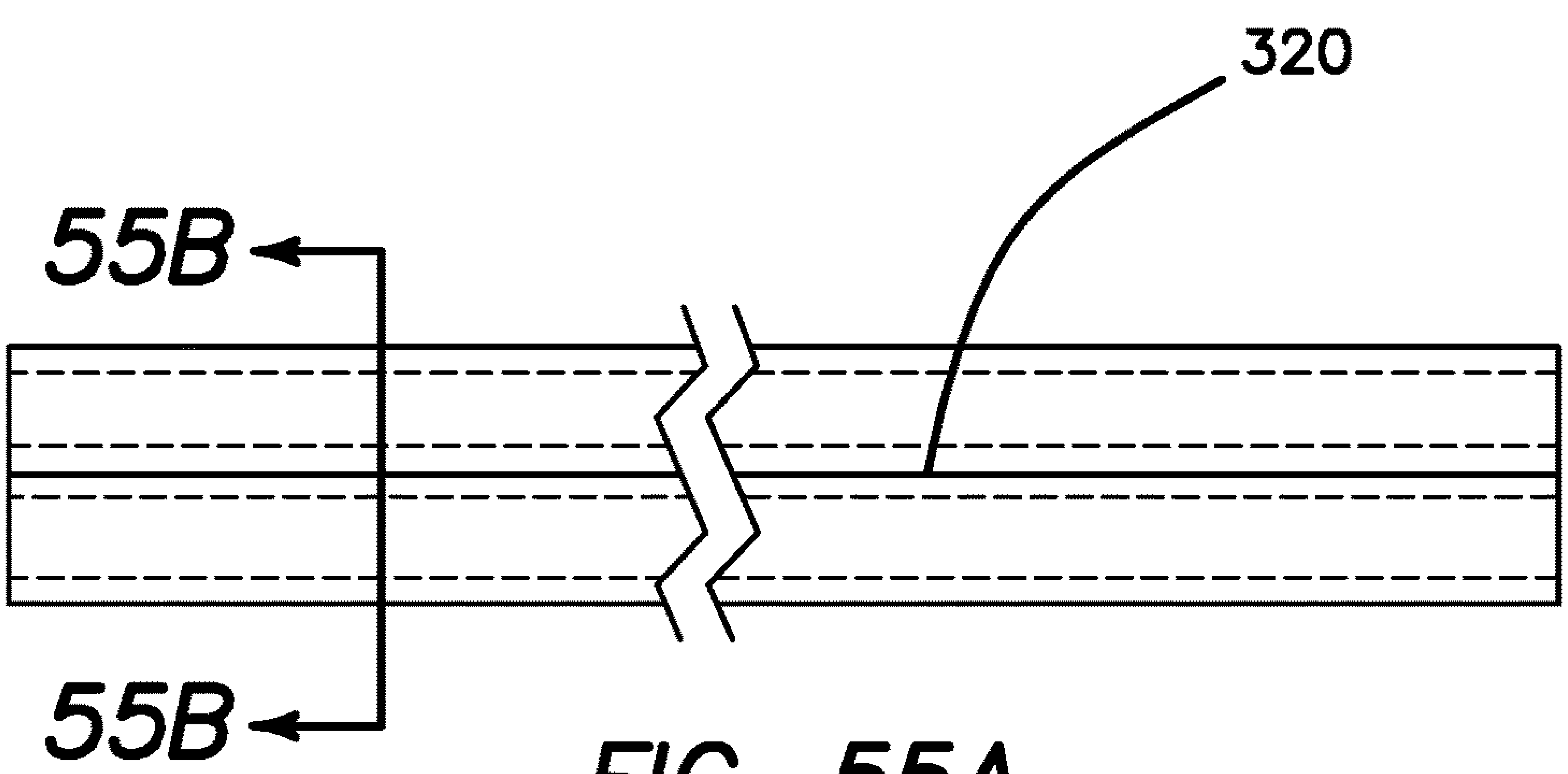

FIG. 55A

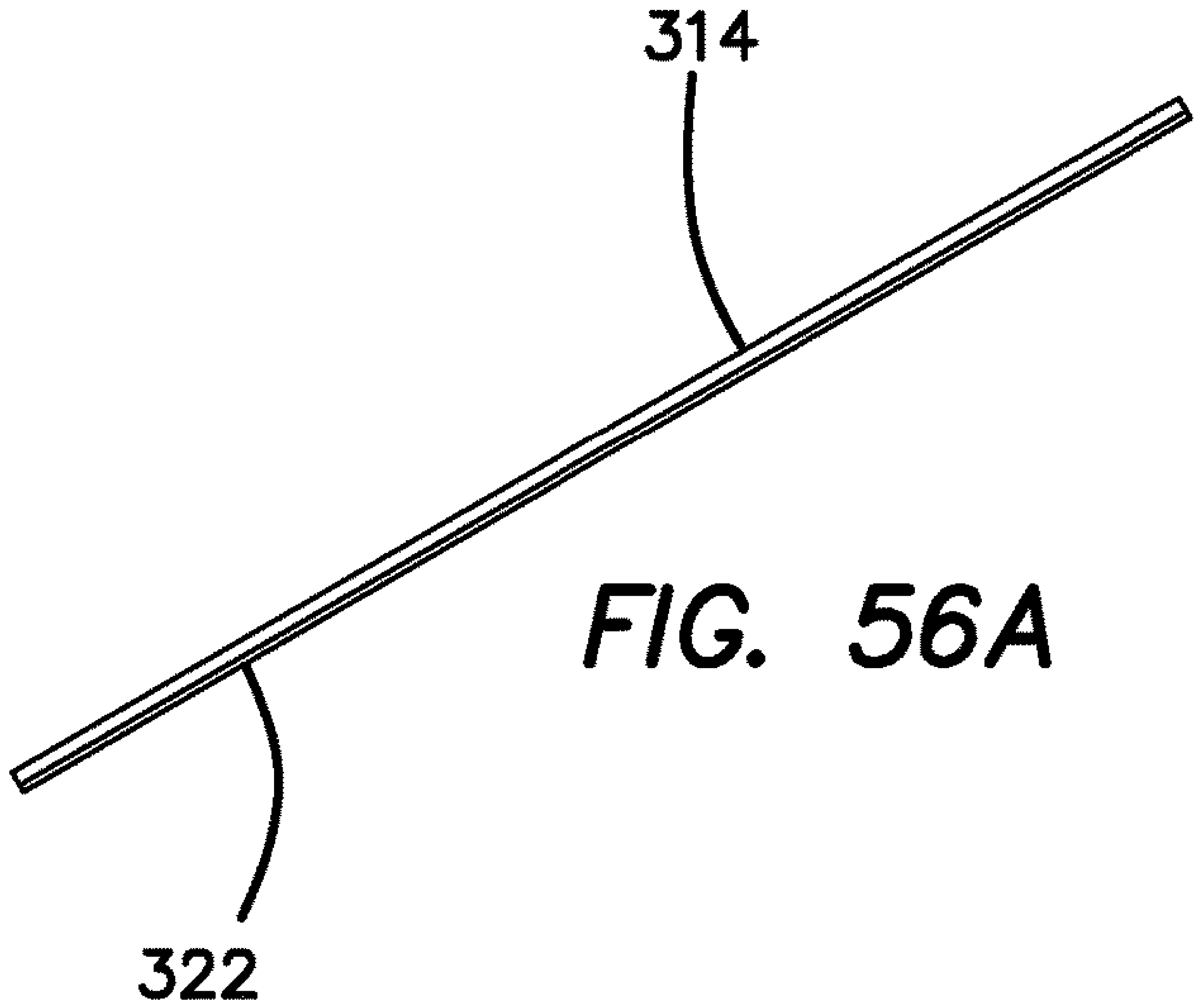

FIG. 56A

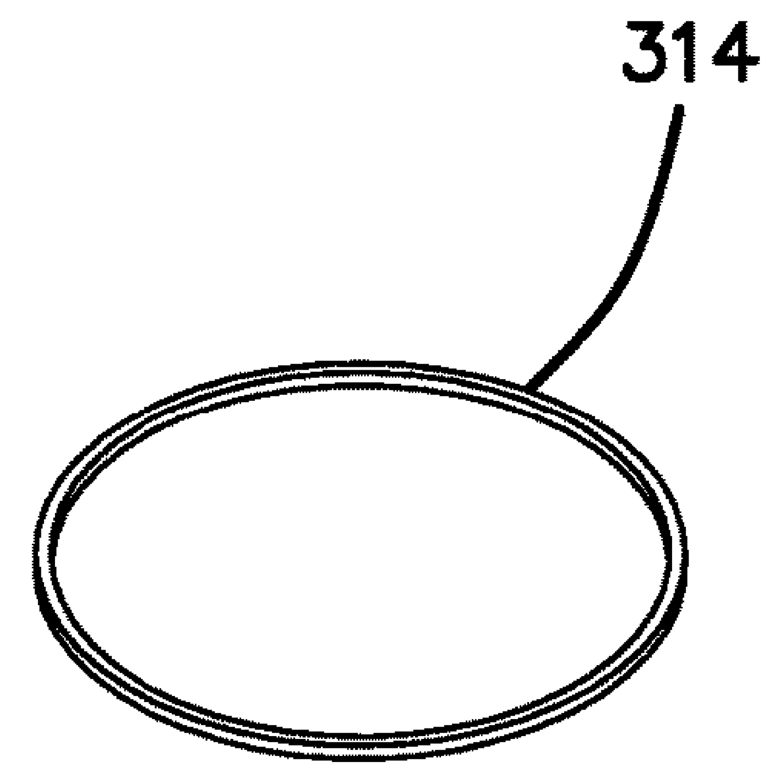

FIG. 56B

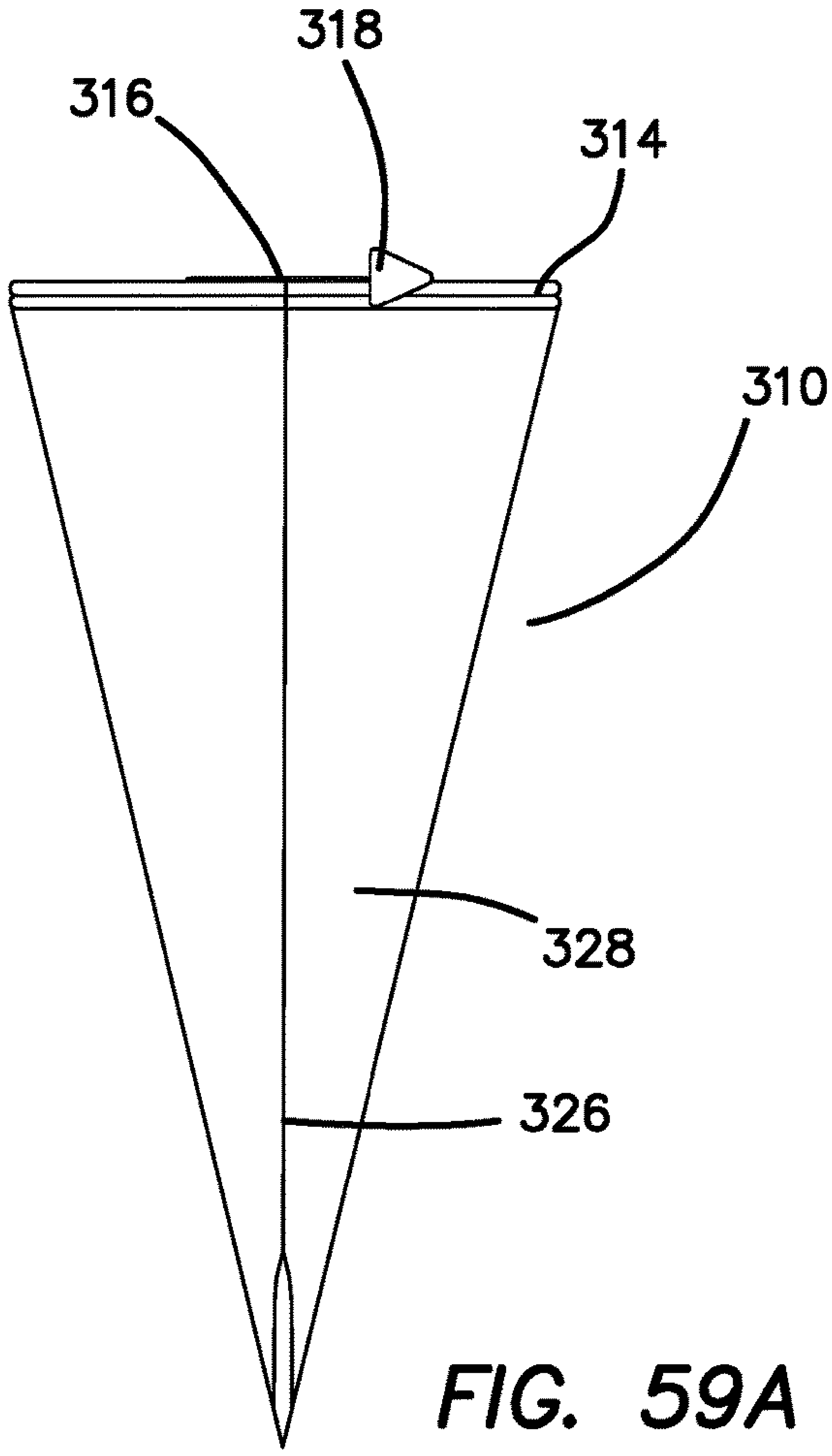

FIG. 59A

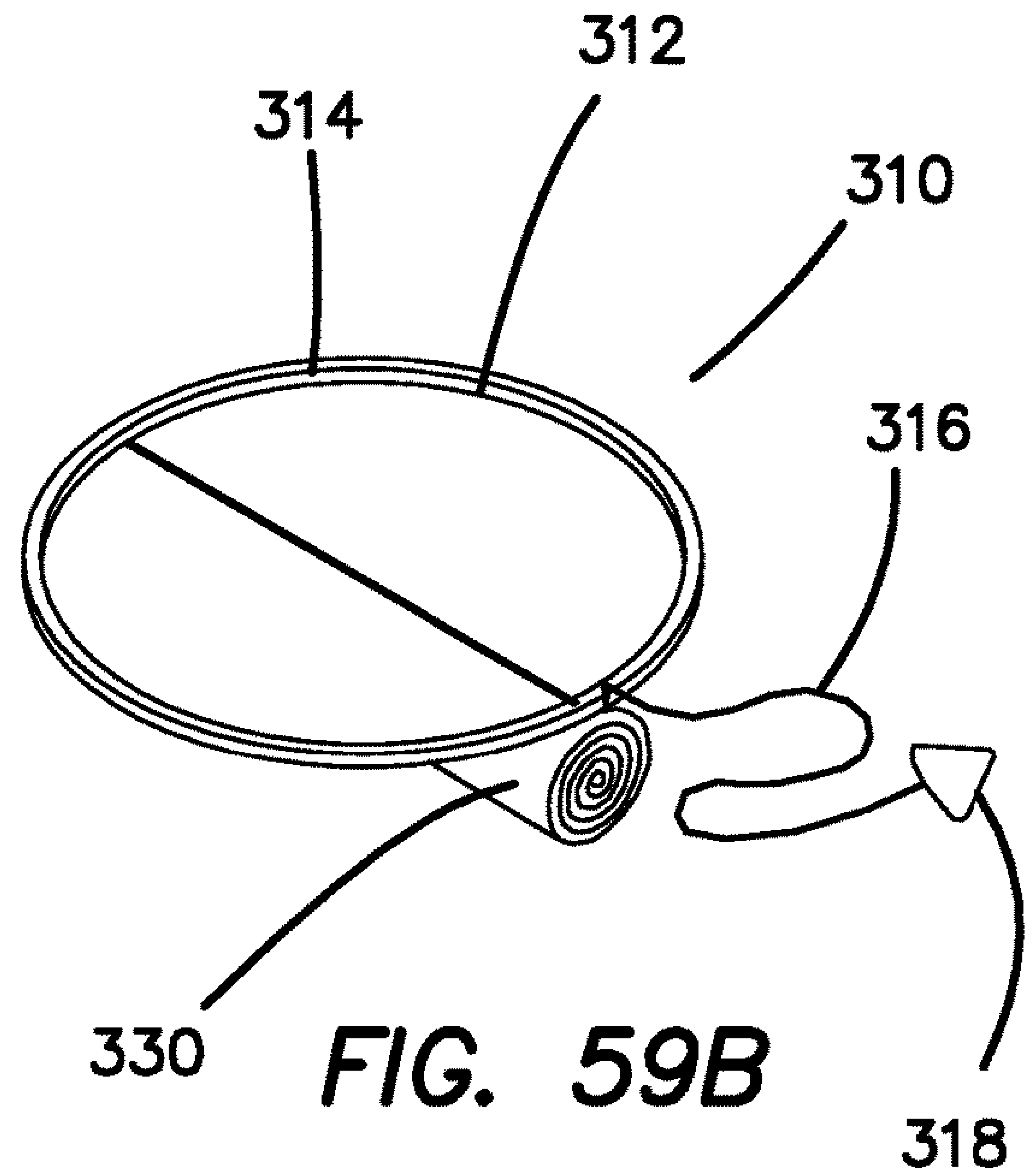

FIG. 59B

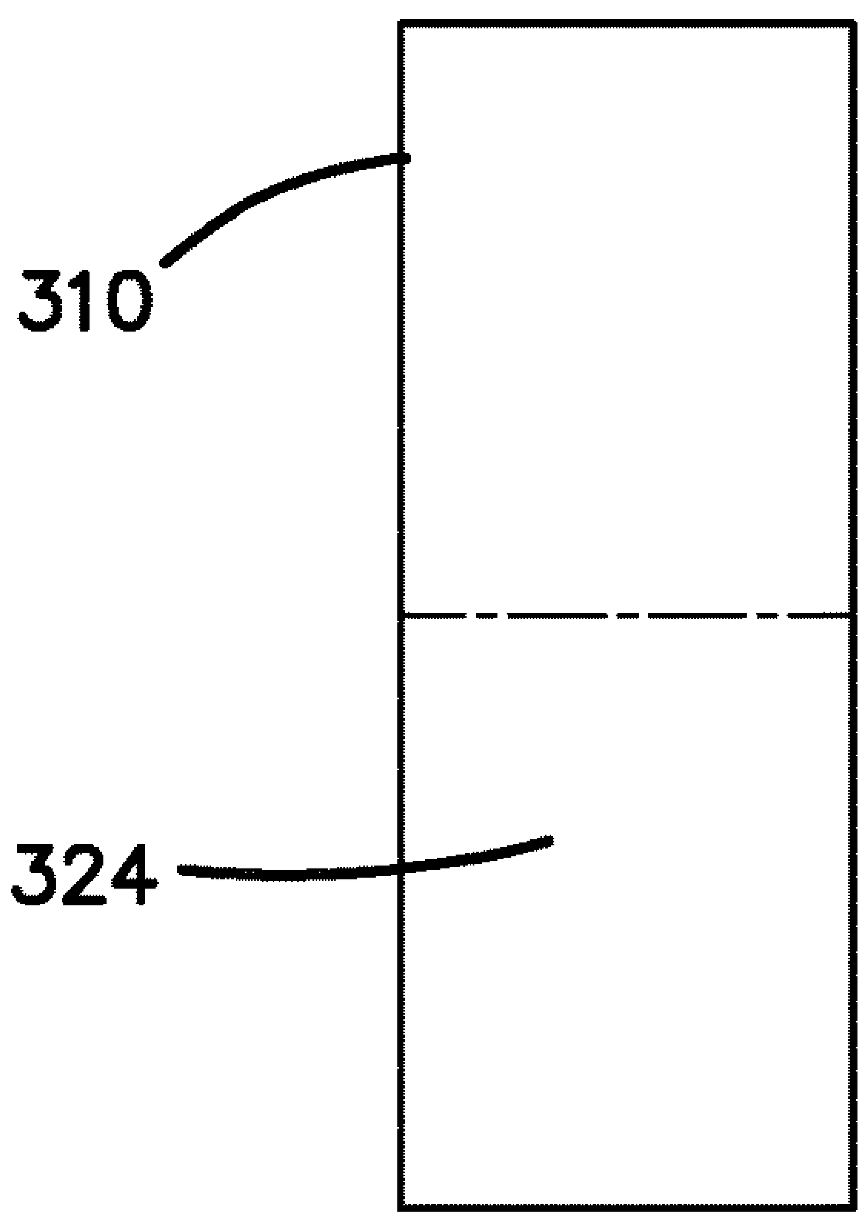

FIG. 57A

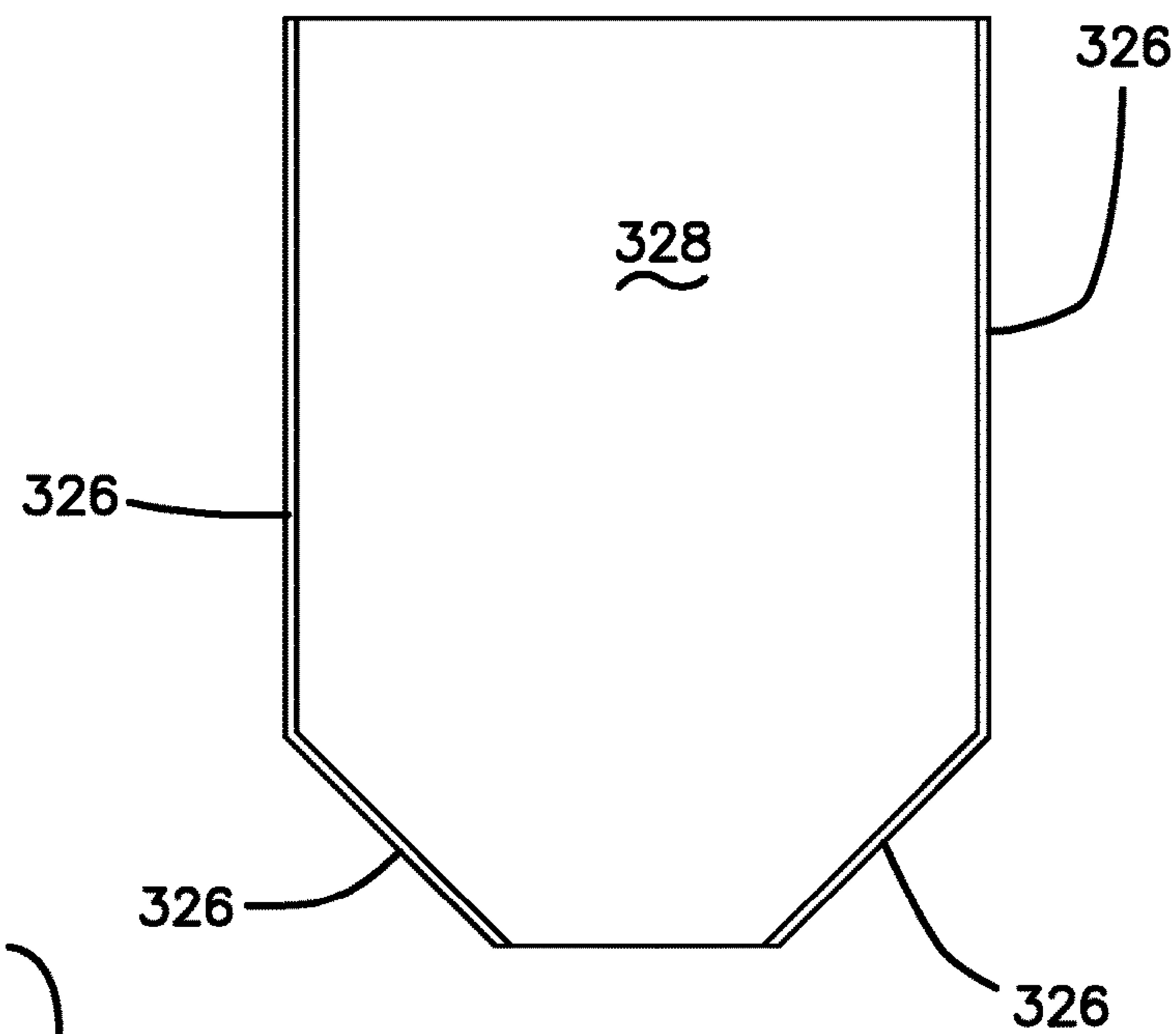

FIG. 57B

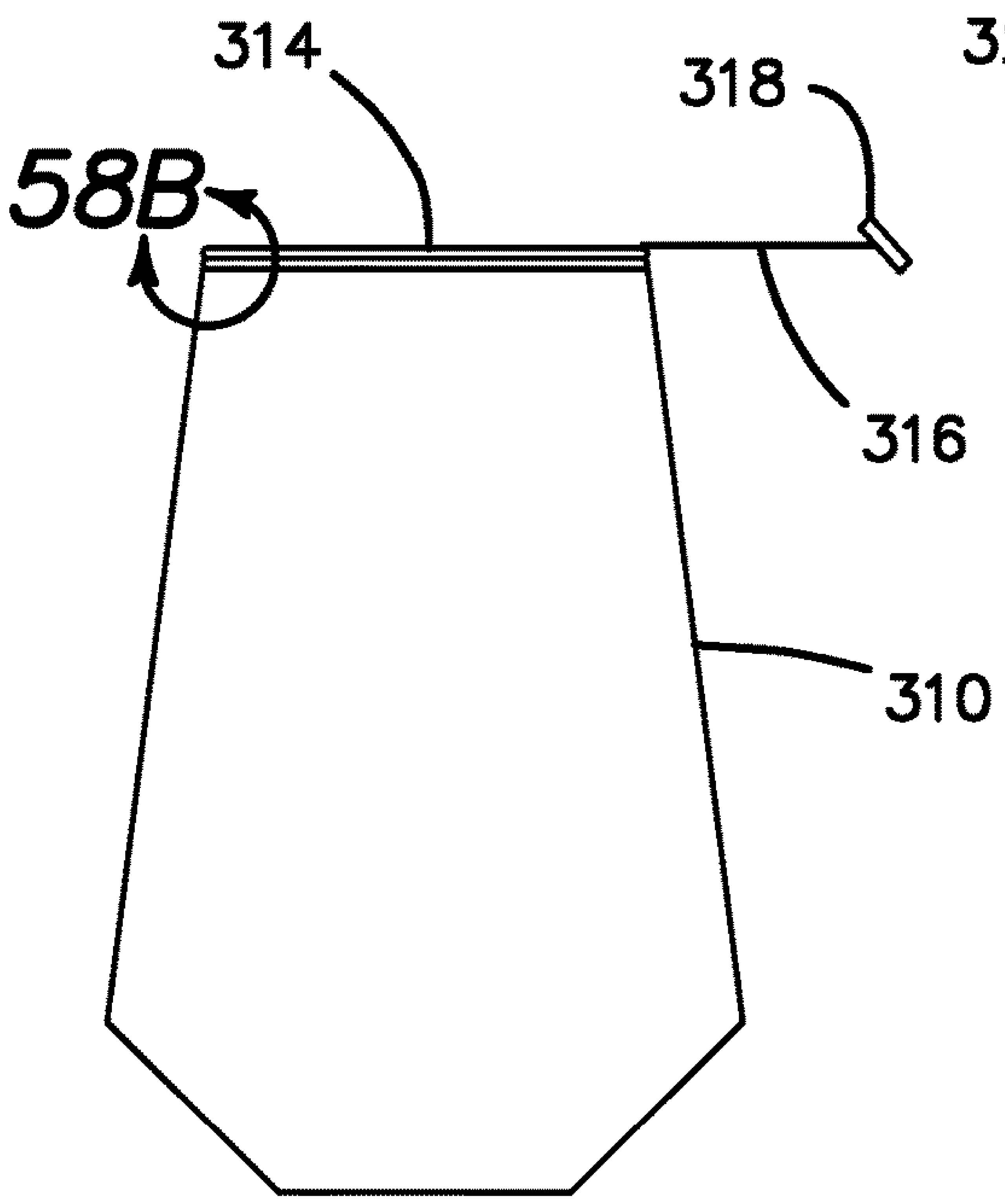

FIG. 58A

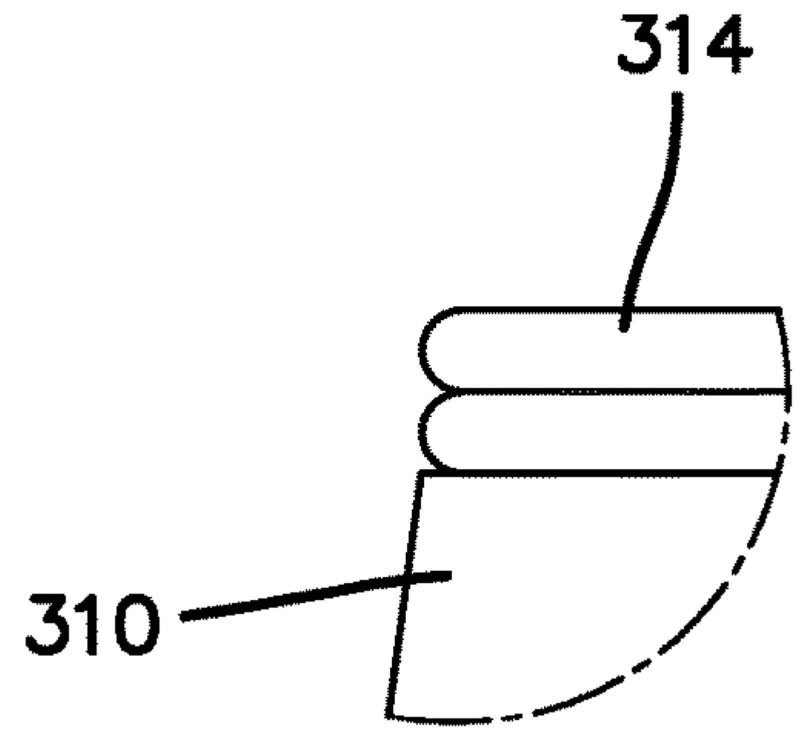

FIG. 58B

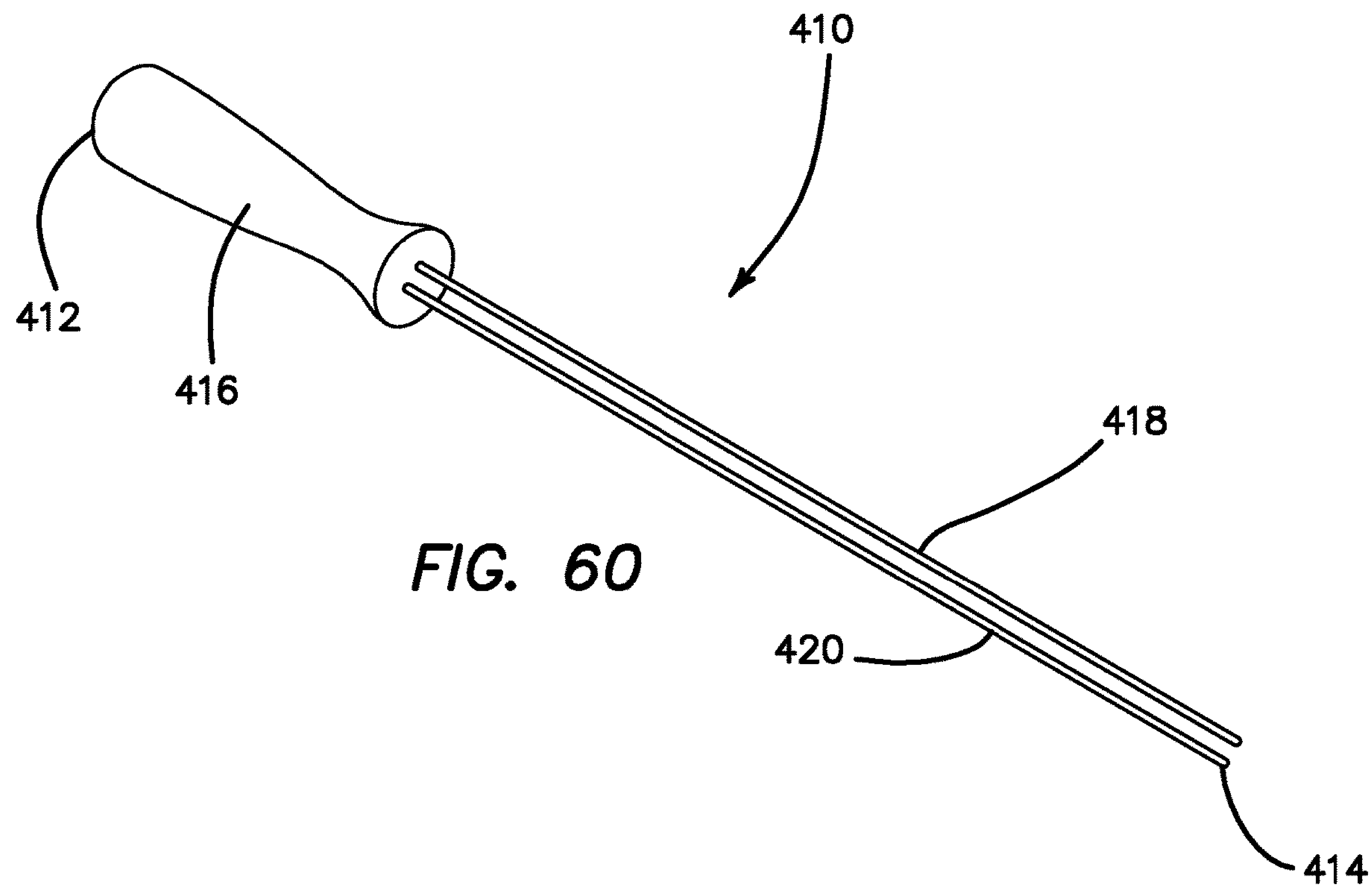

FIG. 60

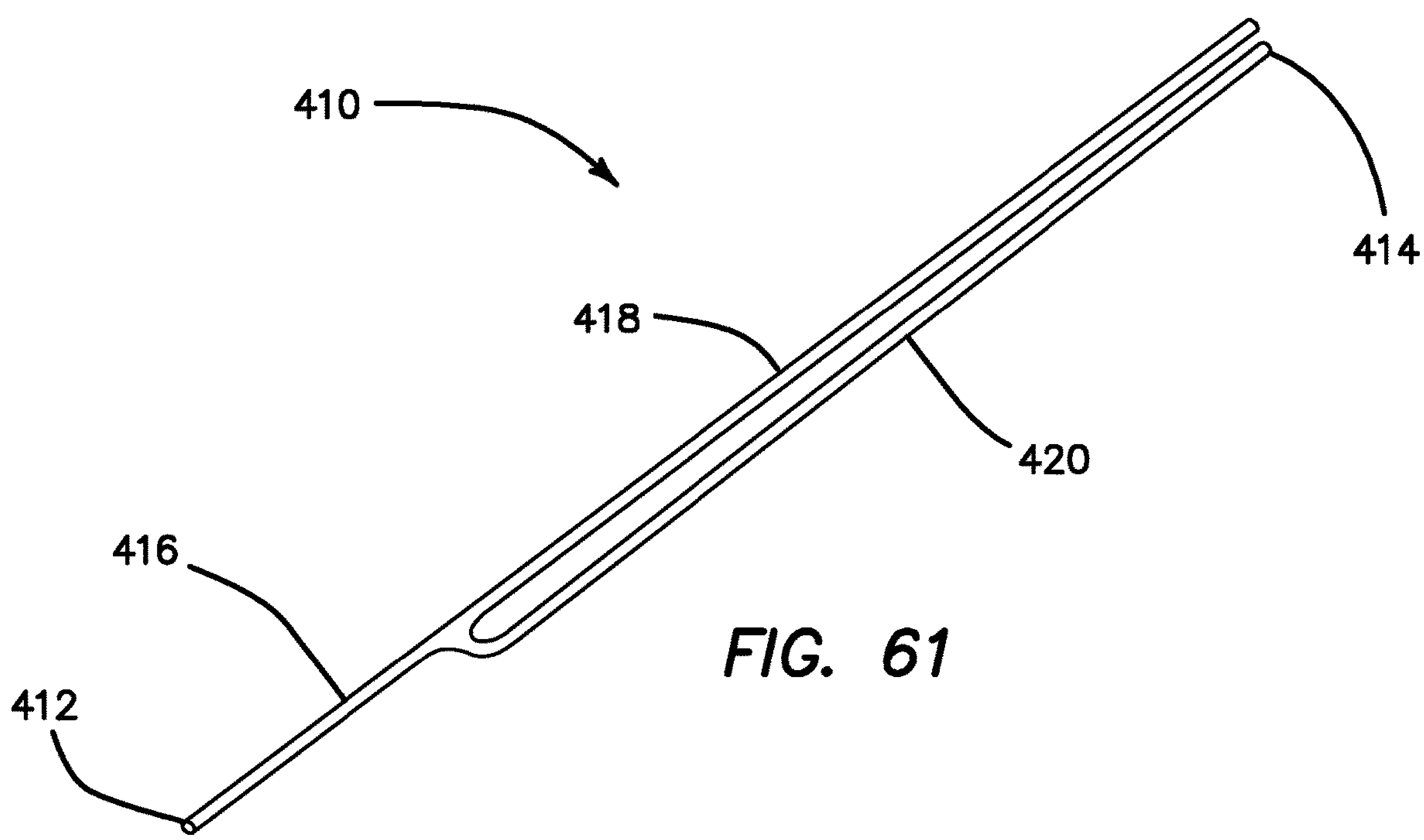

FIG. 61

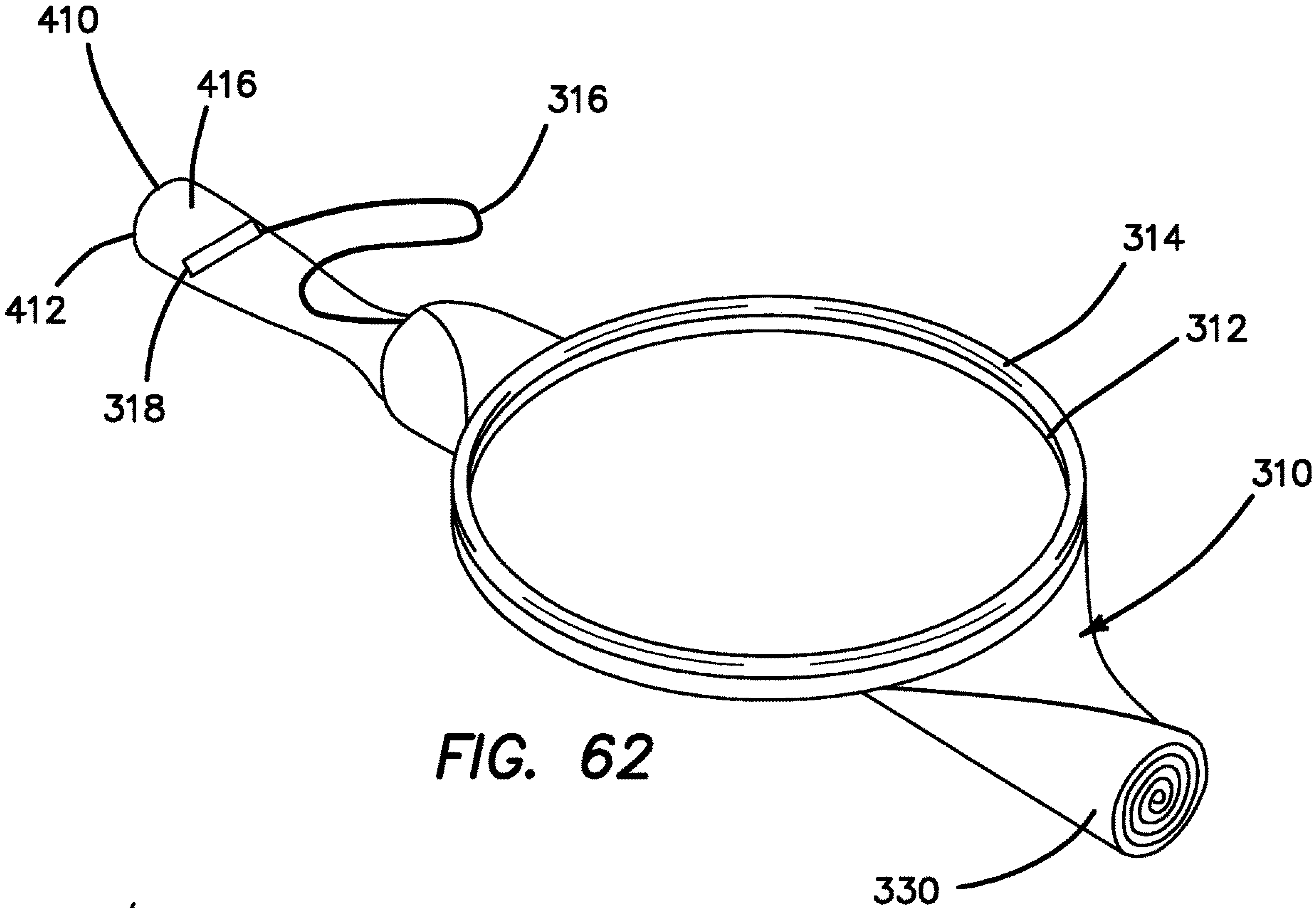
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FIG. 62

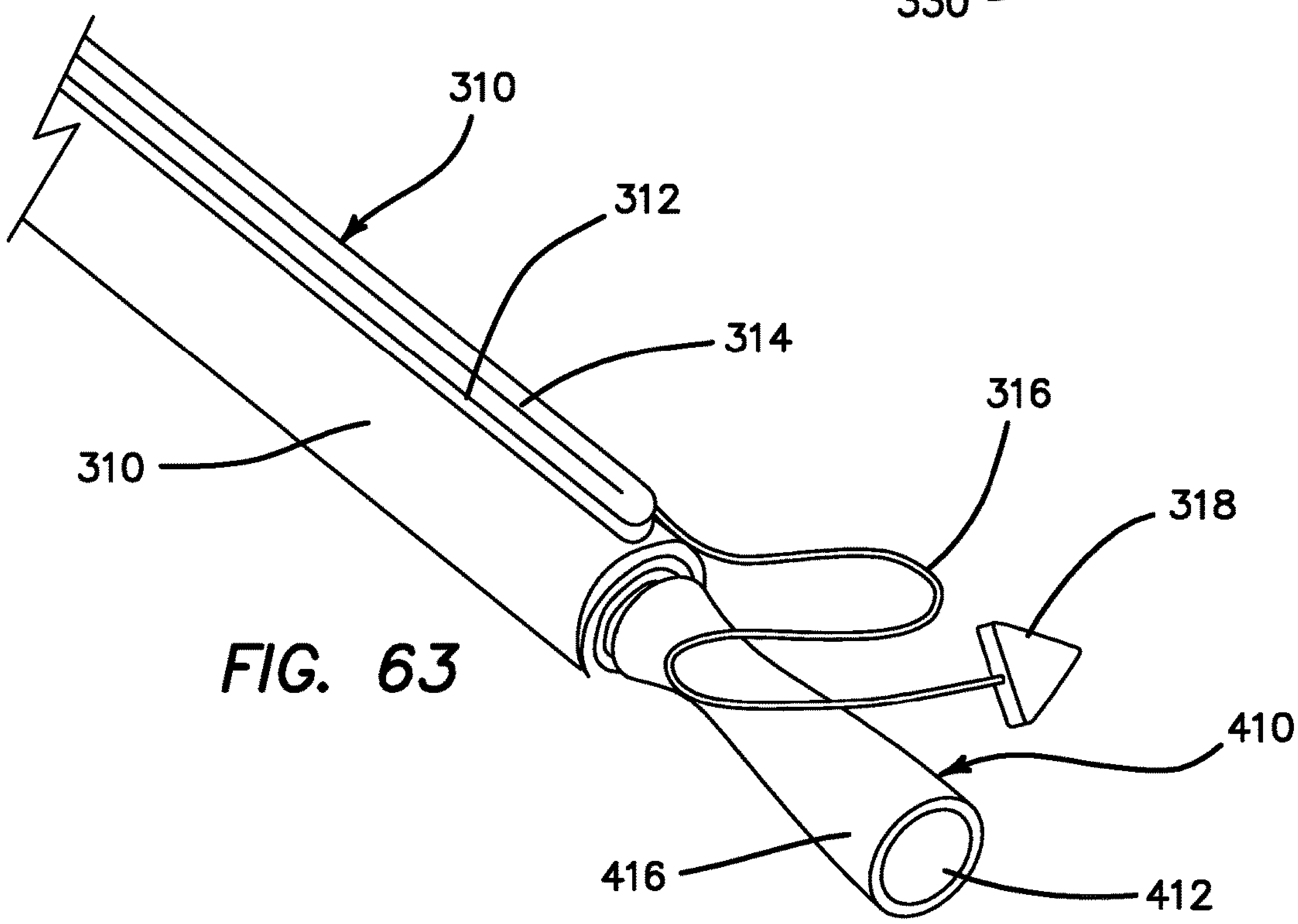
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FIG. 63

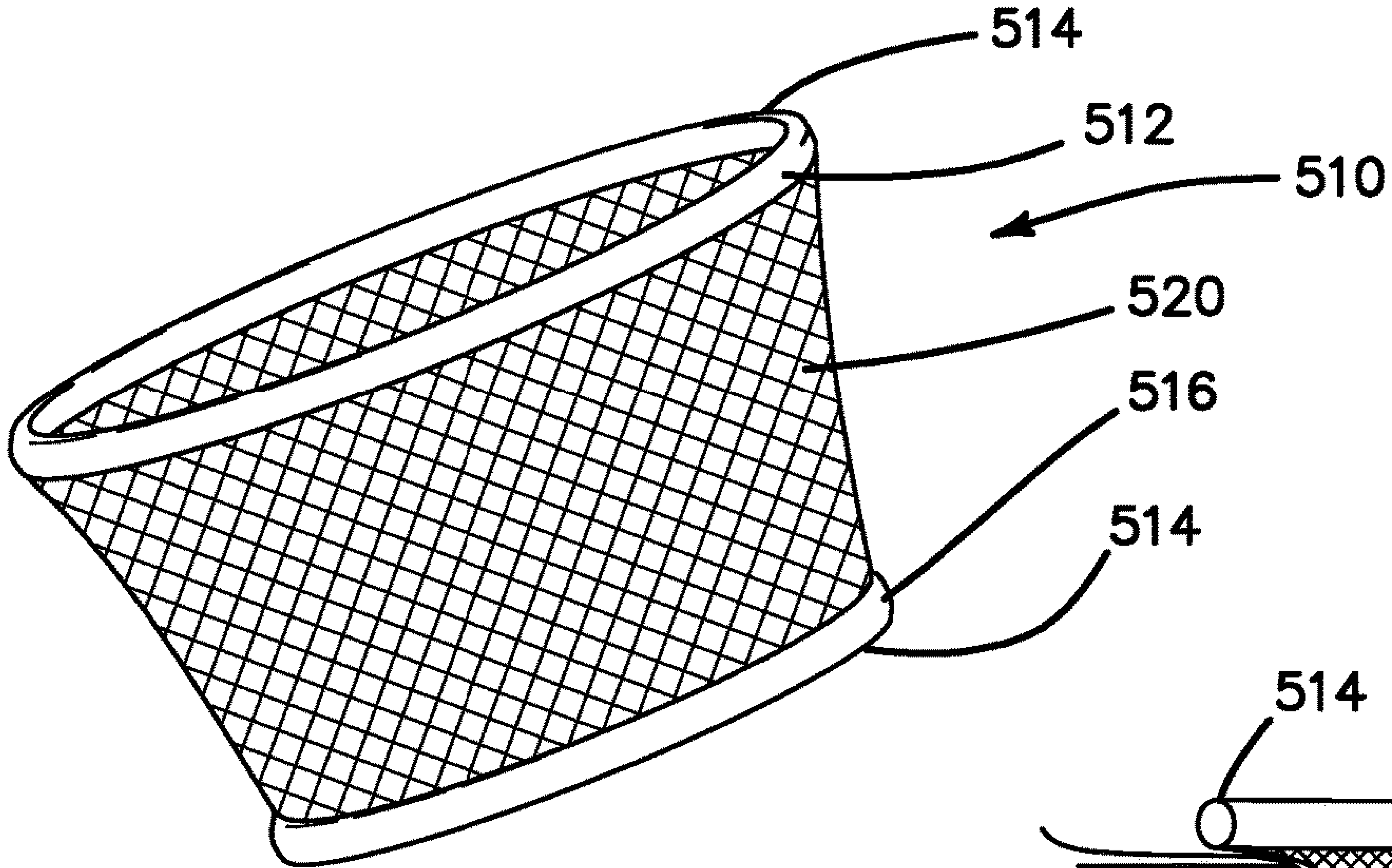

FIG. 64

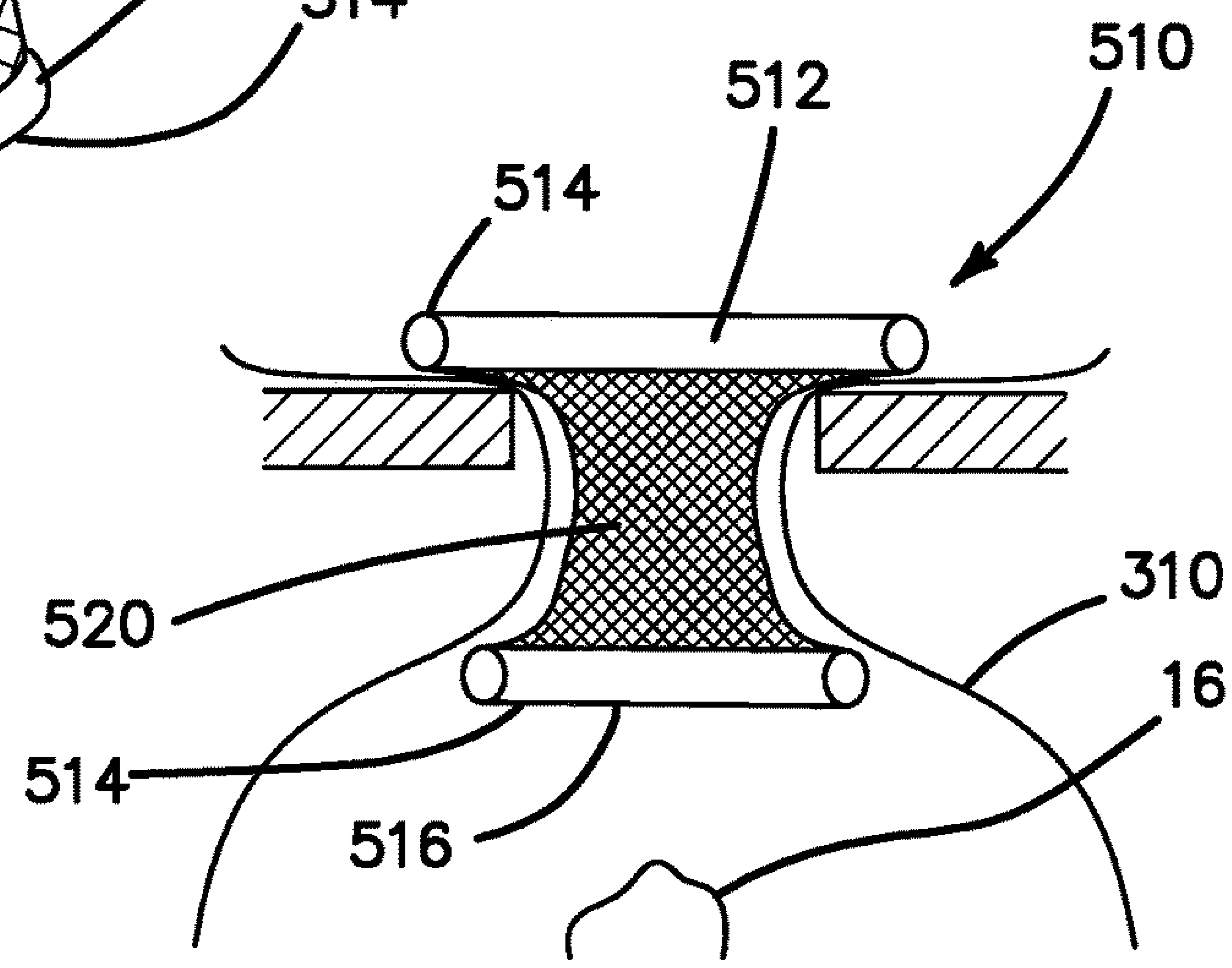

FIG. 65

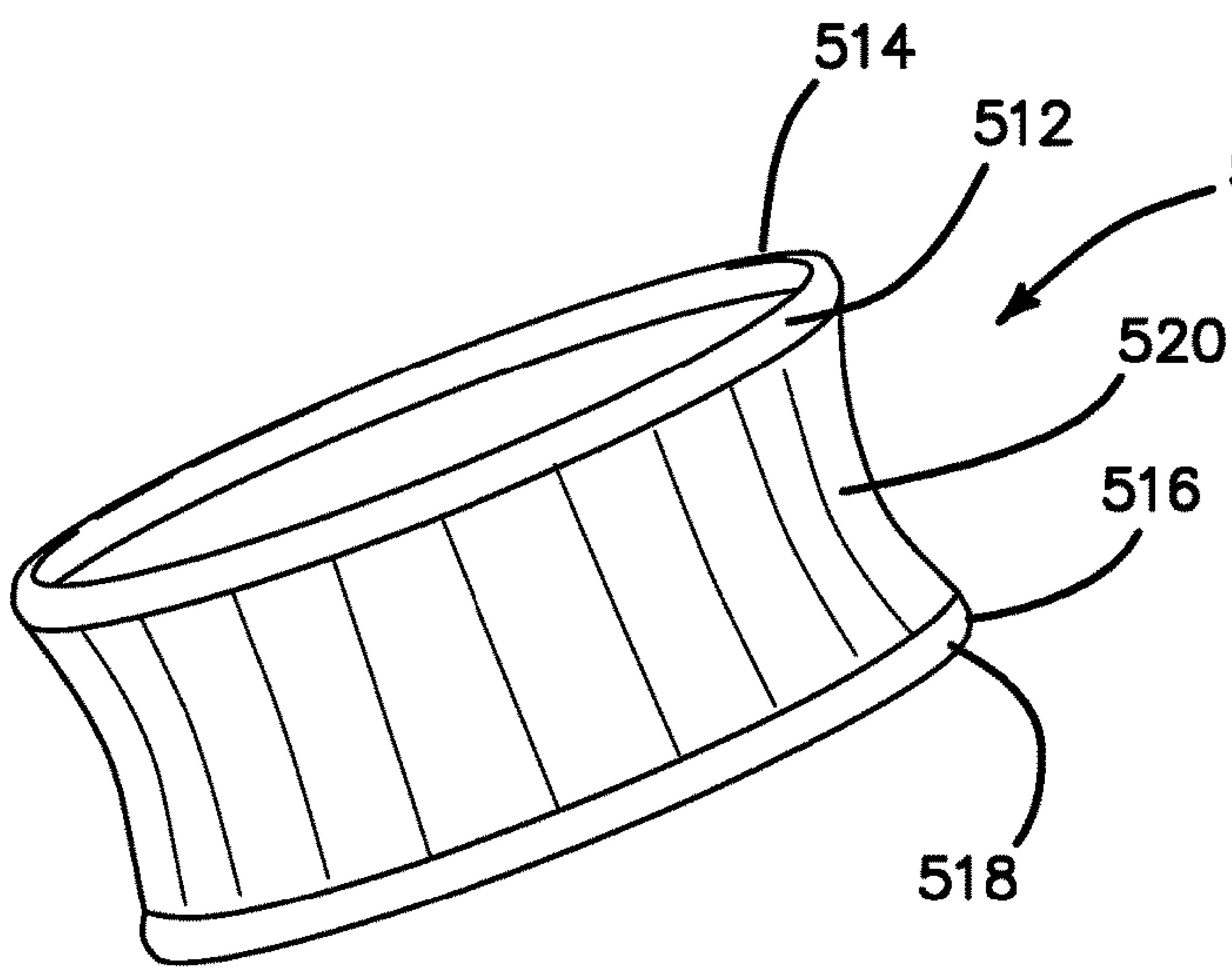

FIG. 66

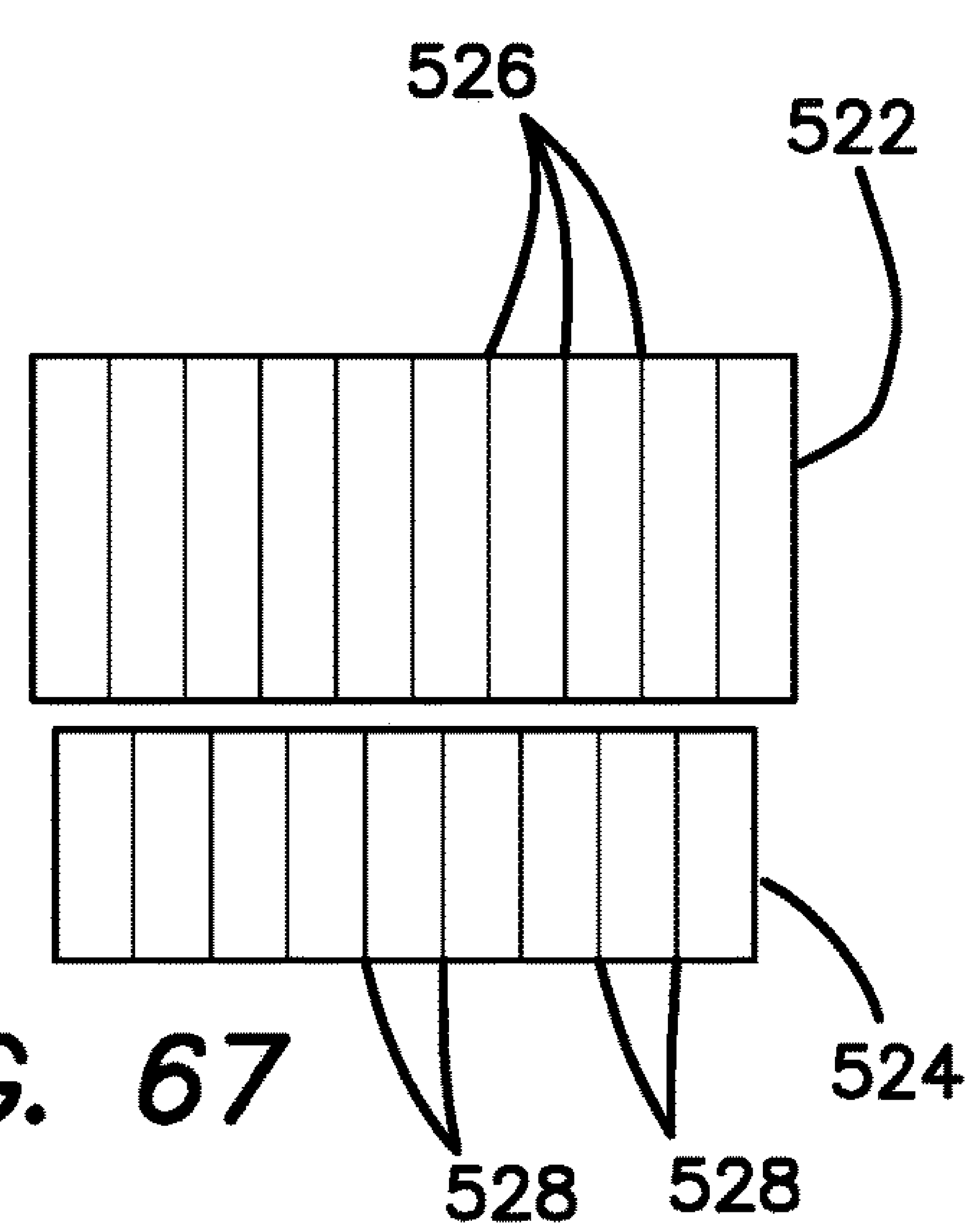

FIG. 67

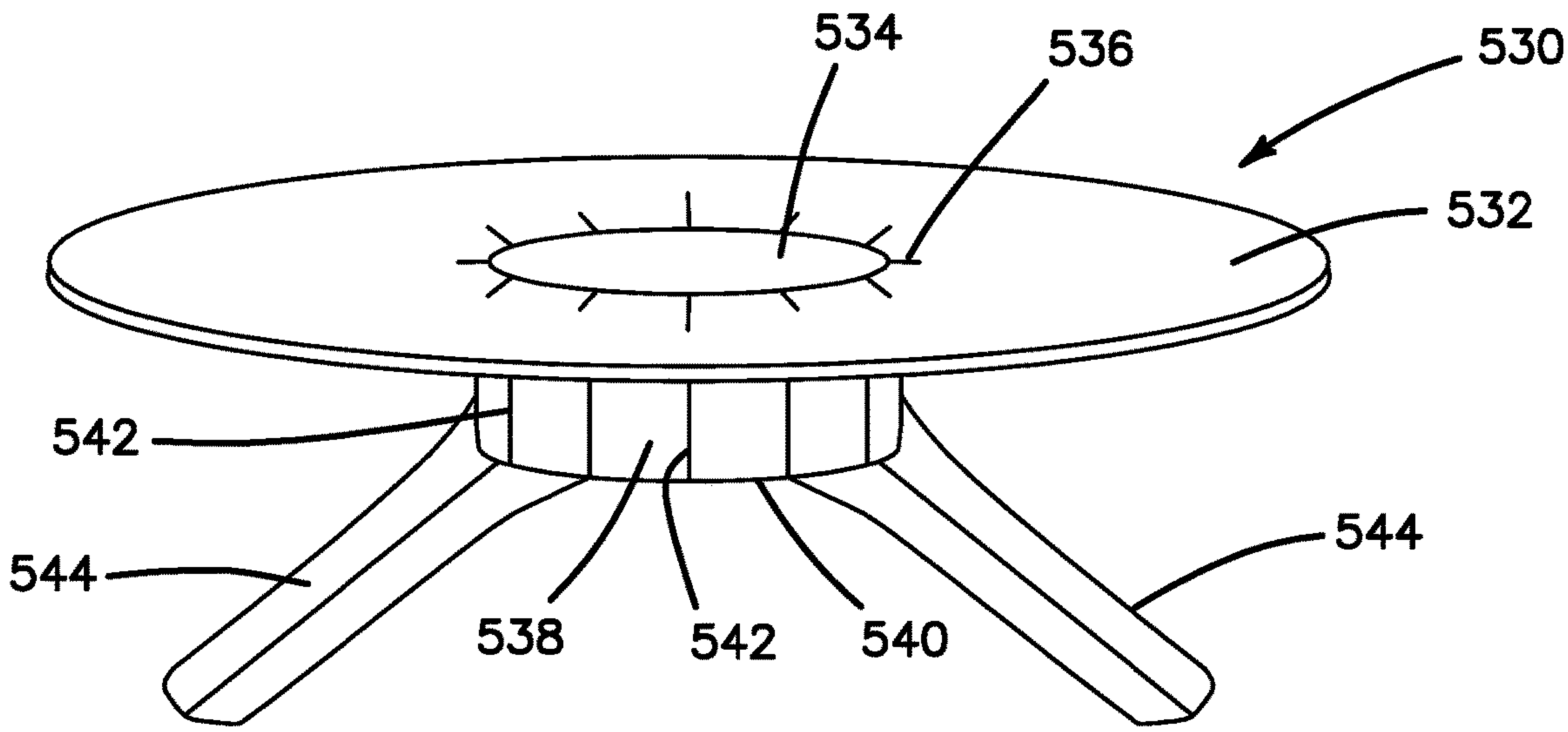

FIG. 68

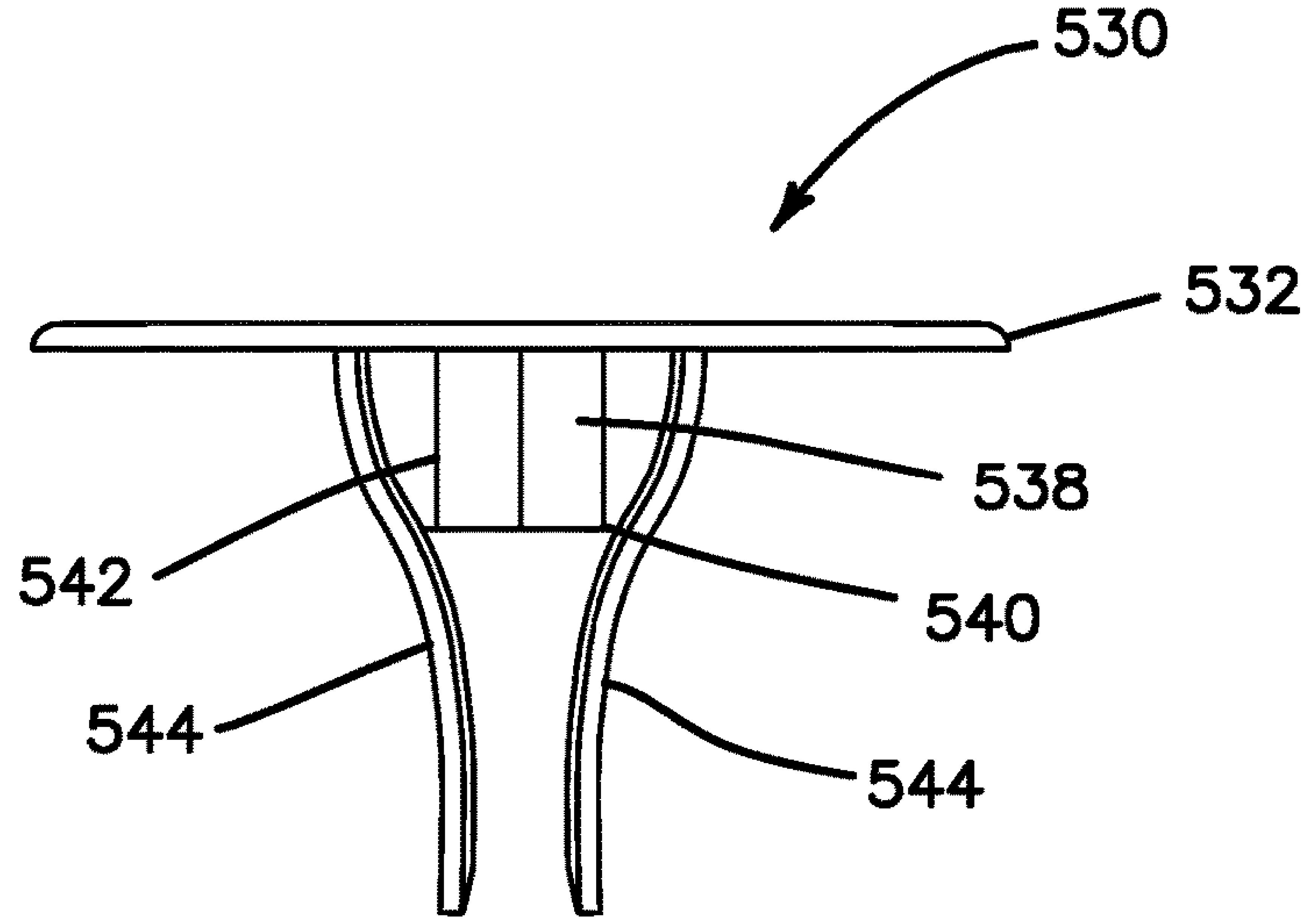

FIG. 69

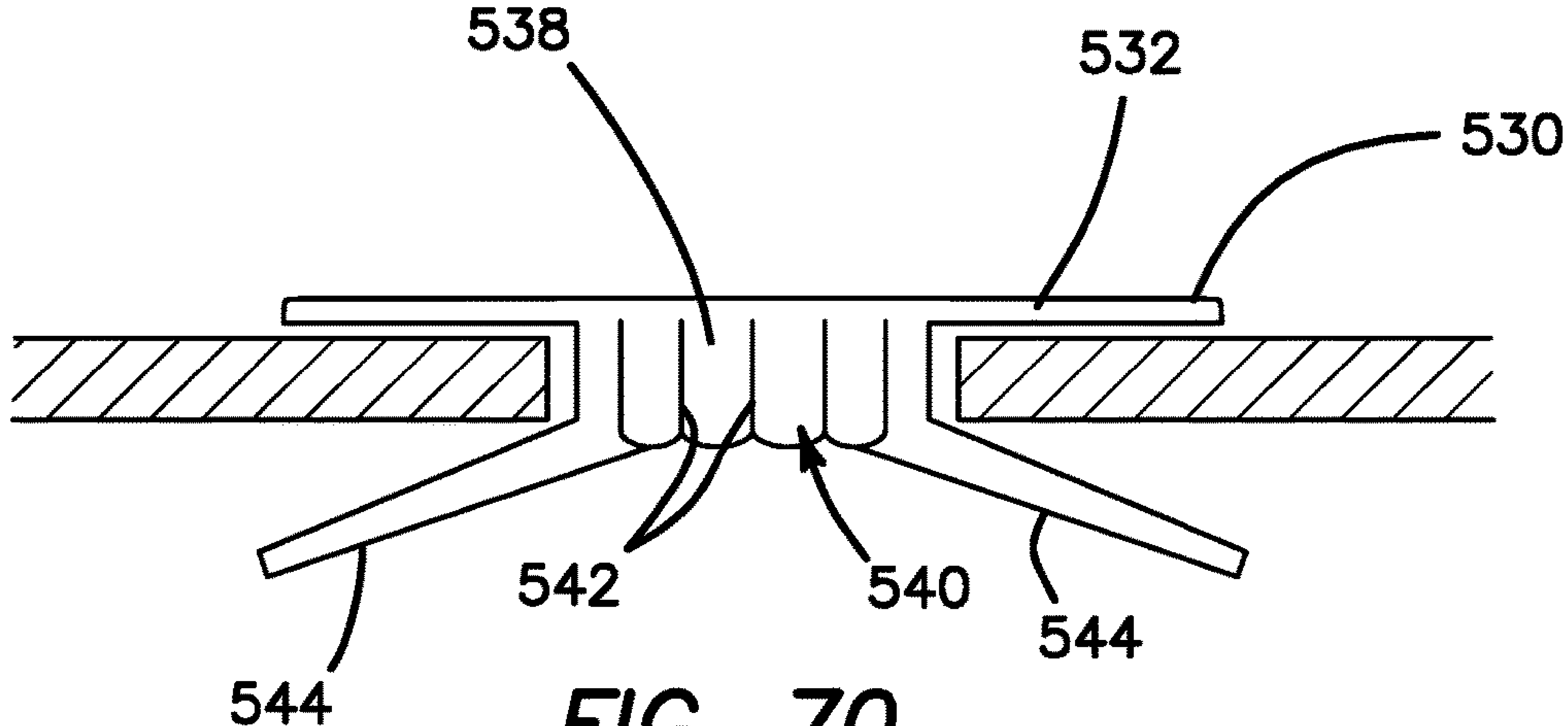

FIG. 70

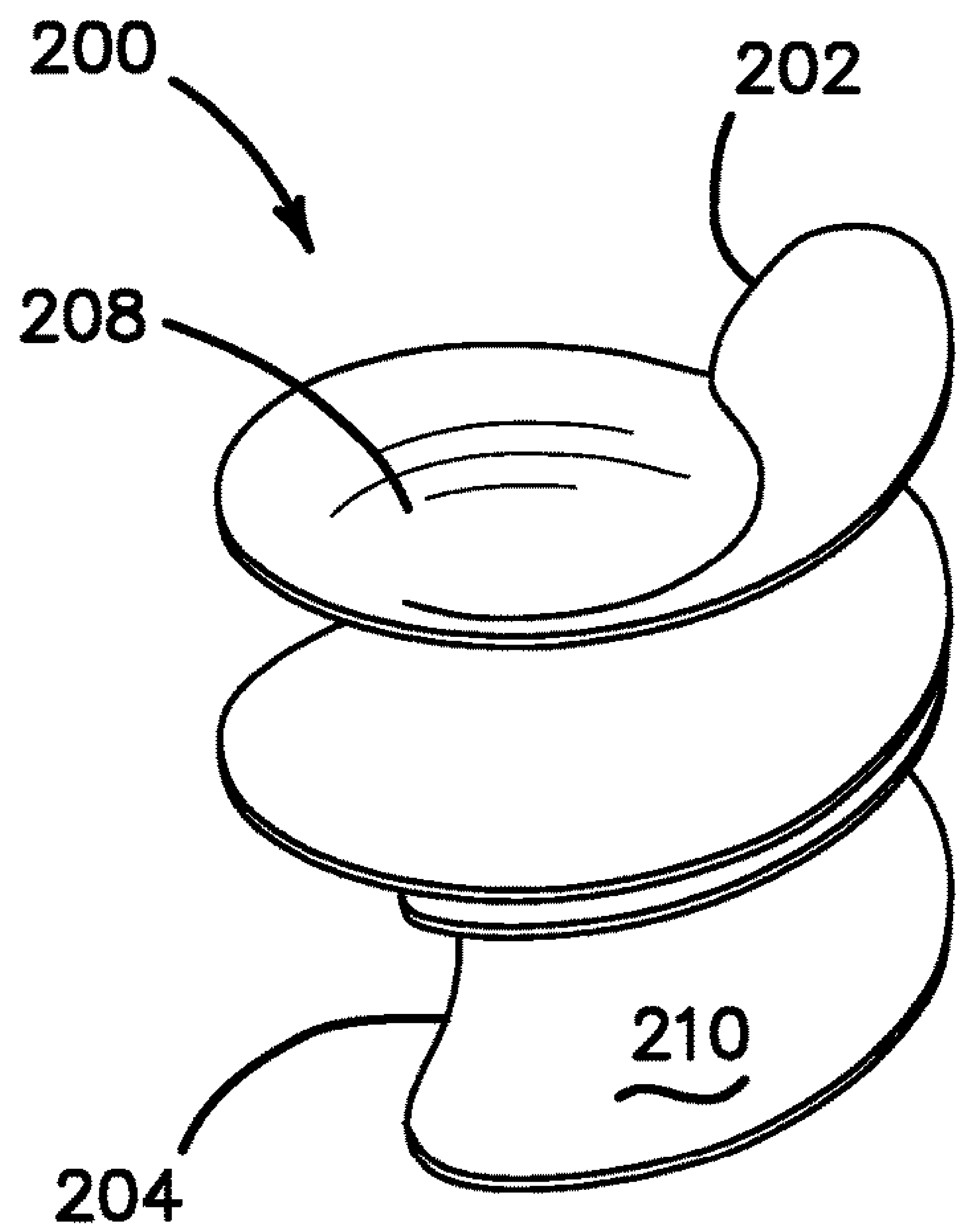

FIG. 71A

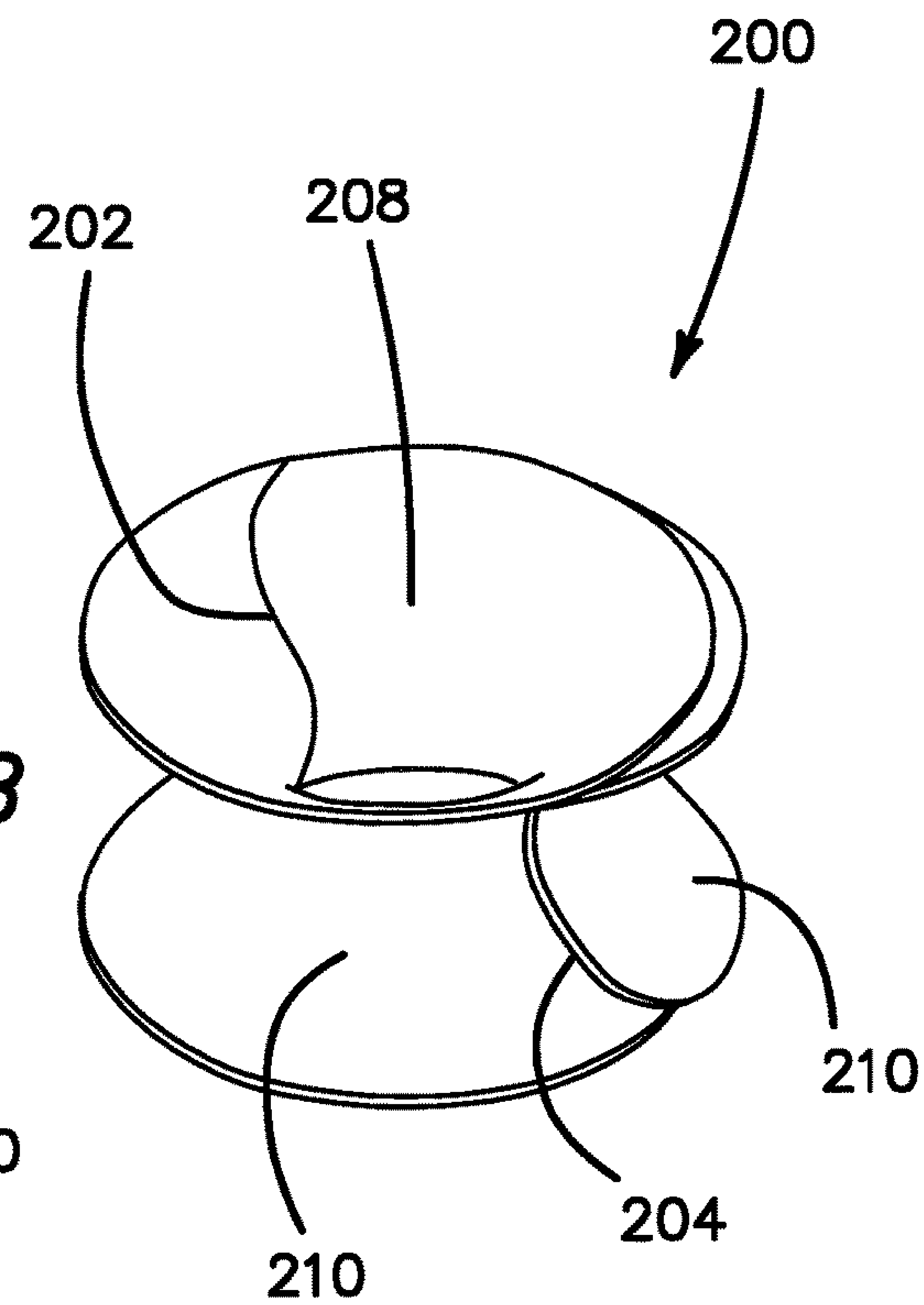

FIG. 71B

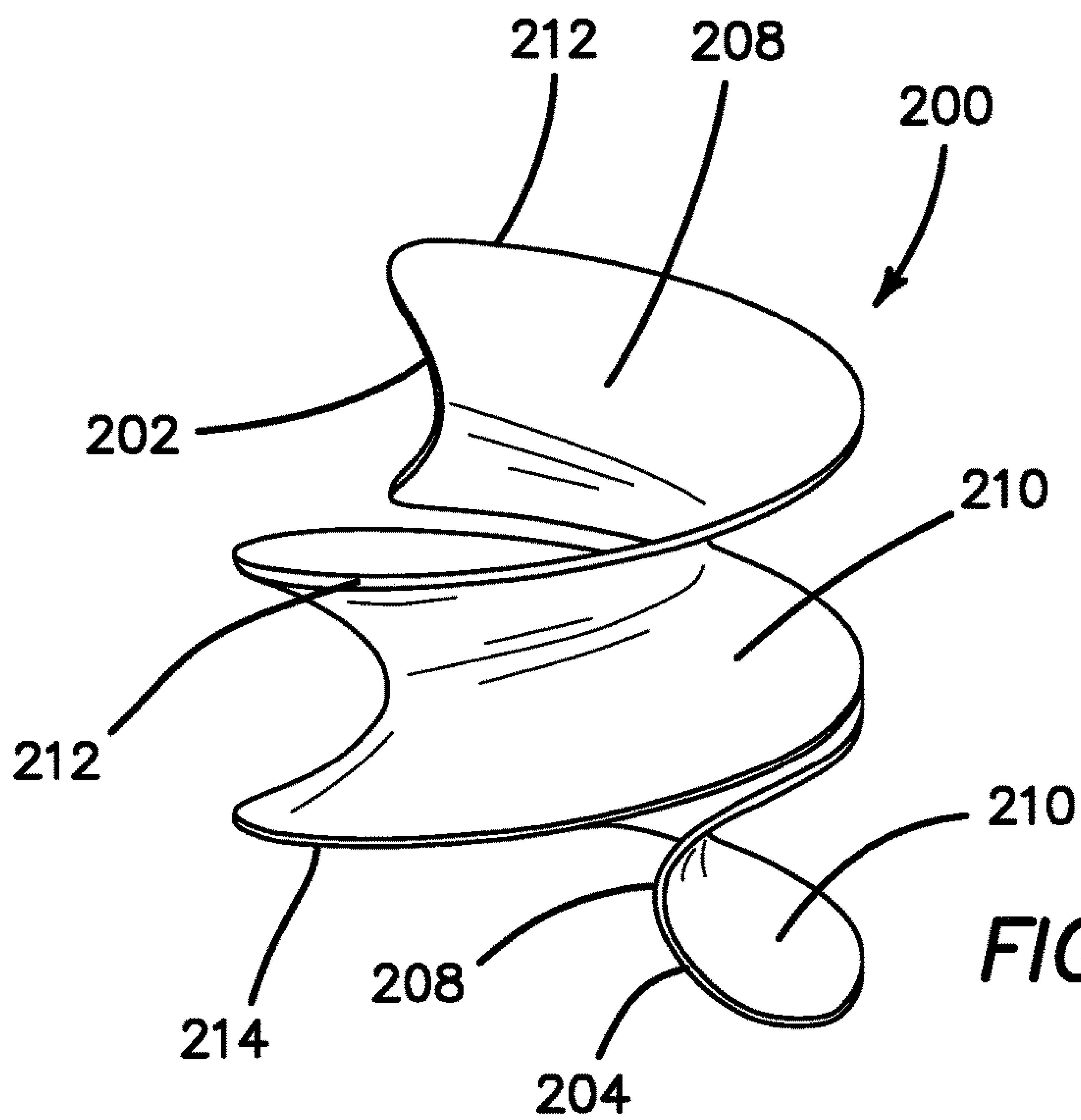

FIG. 72

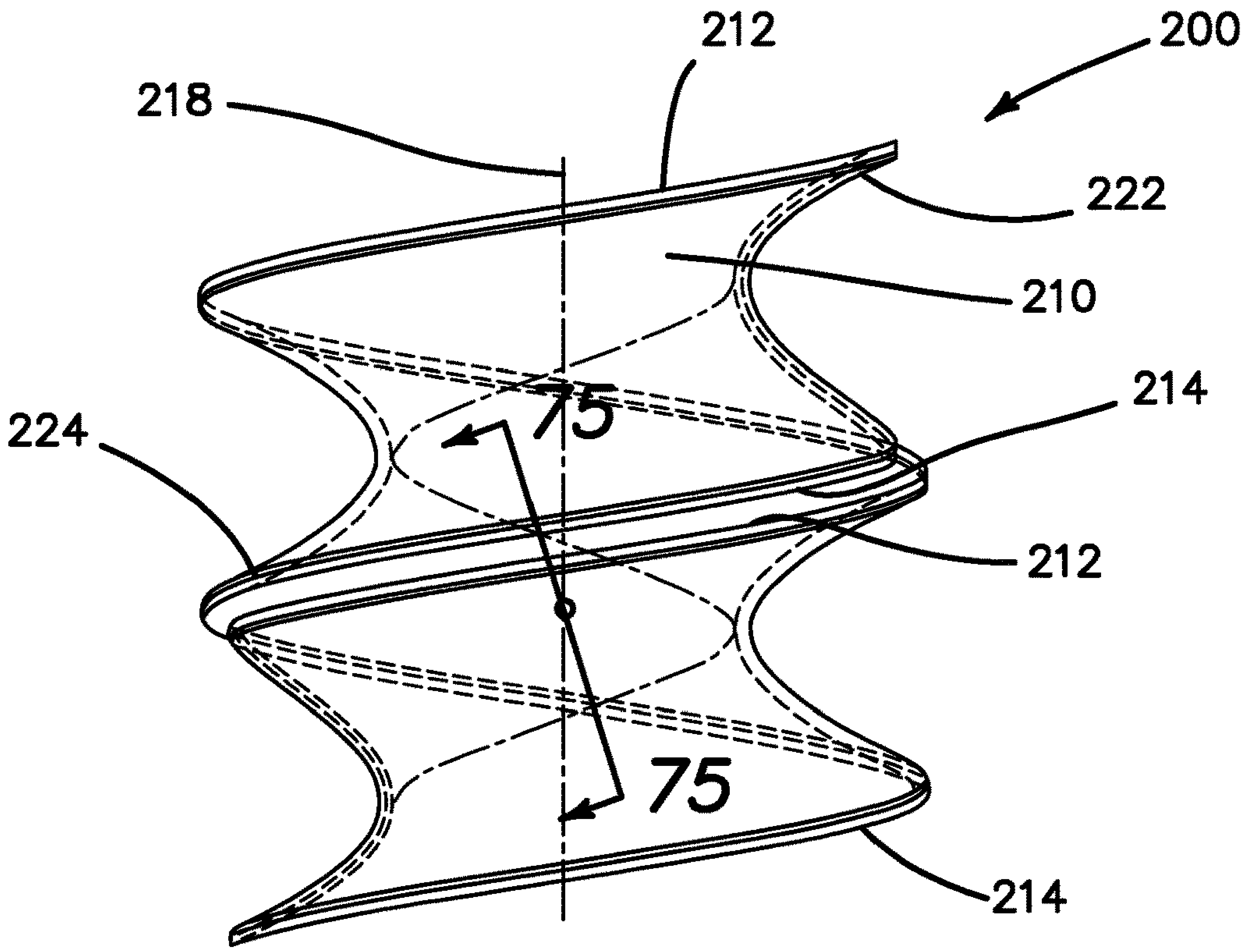
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FIG. 73

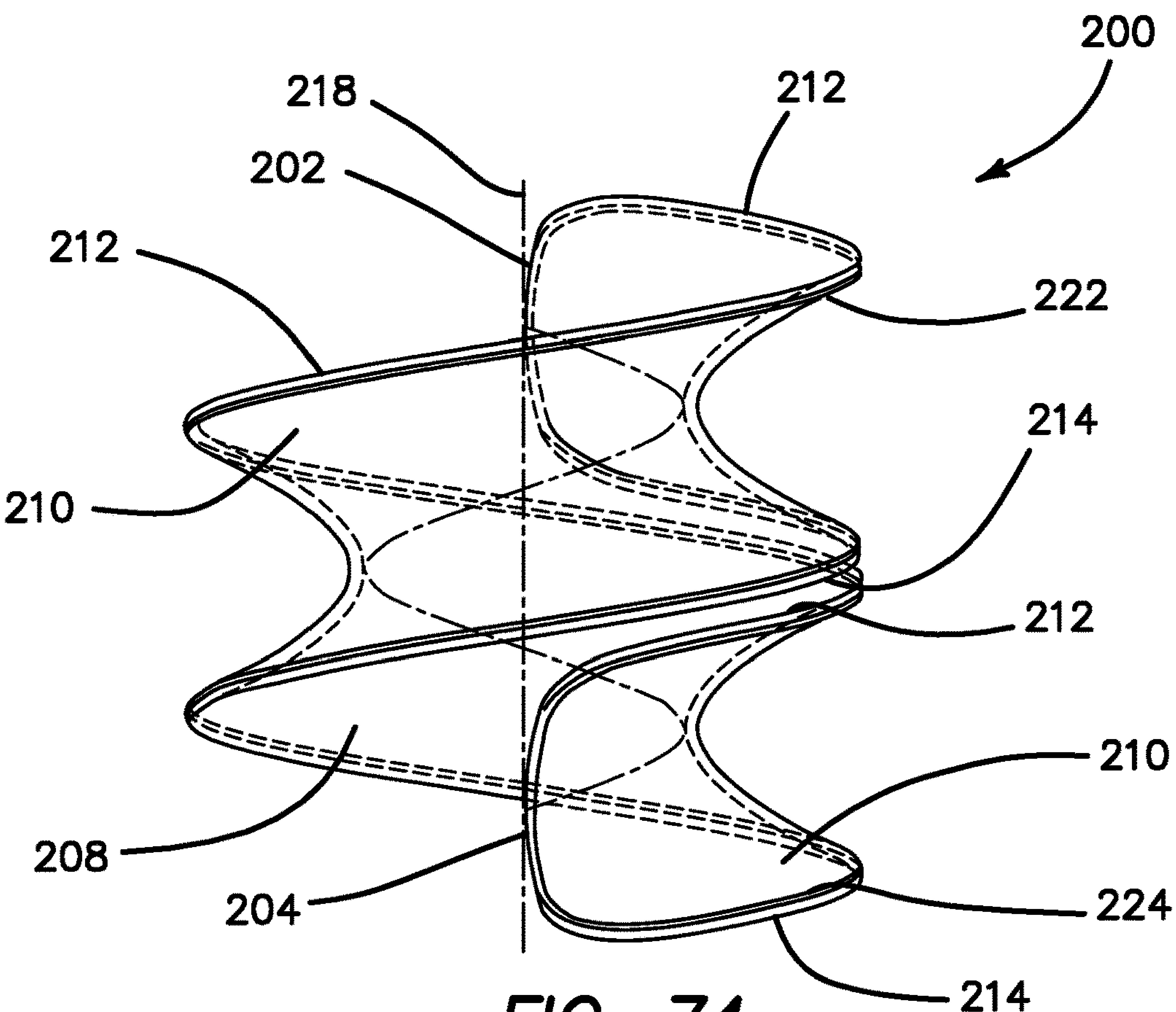
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FIG. 74

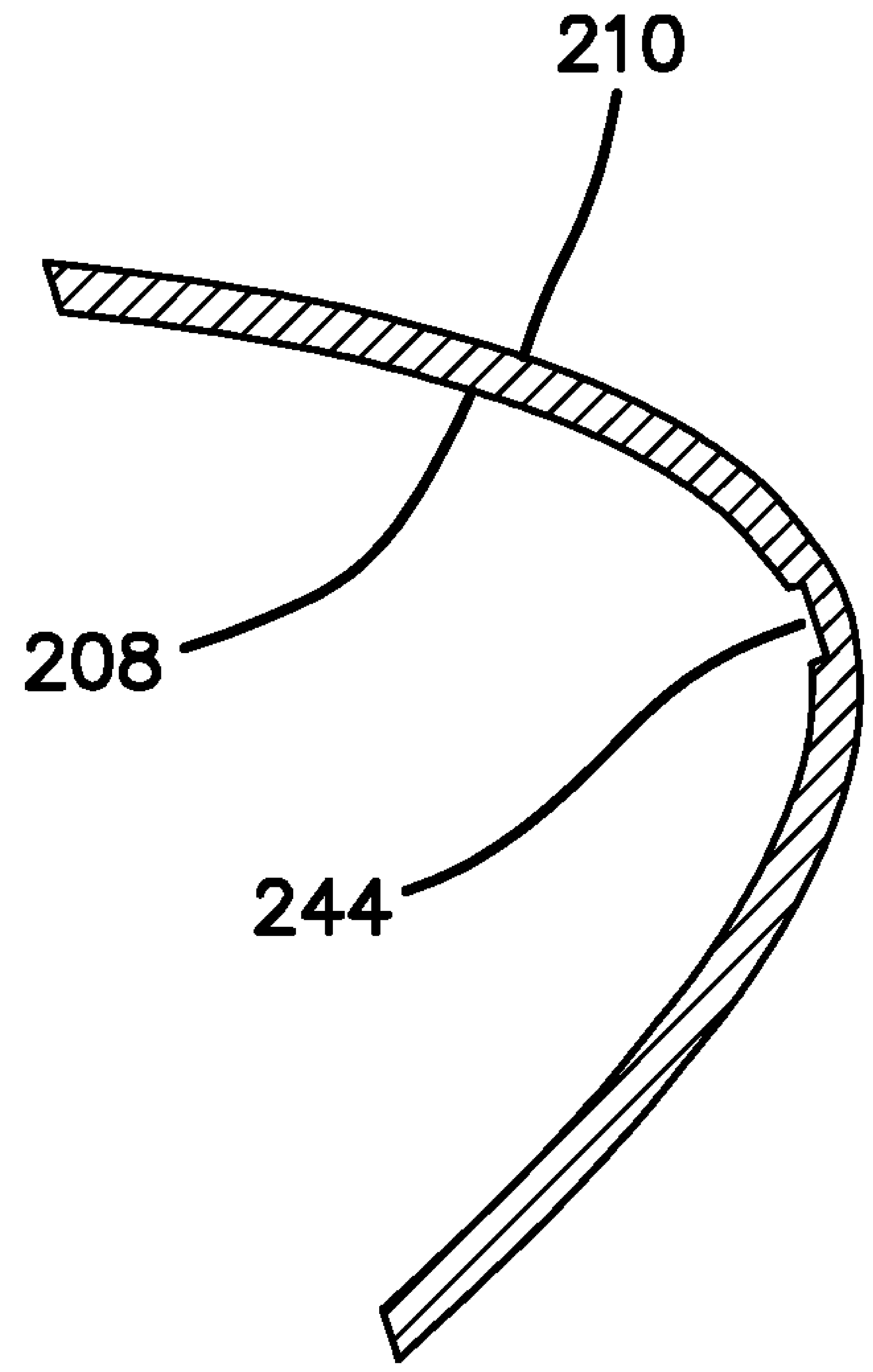

FIG. 75

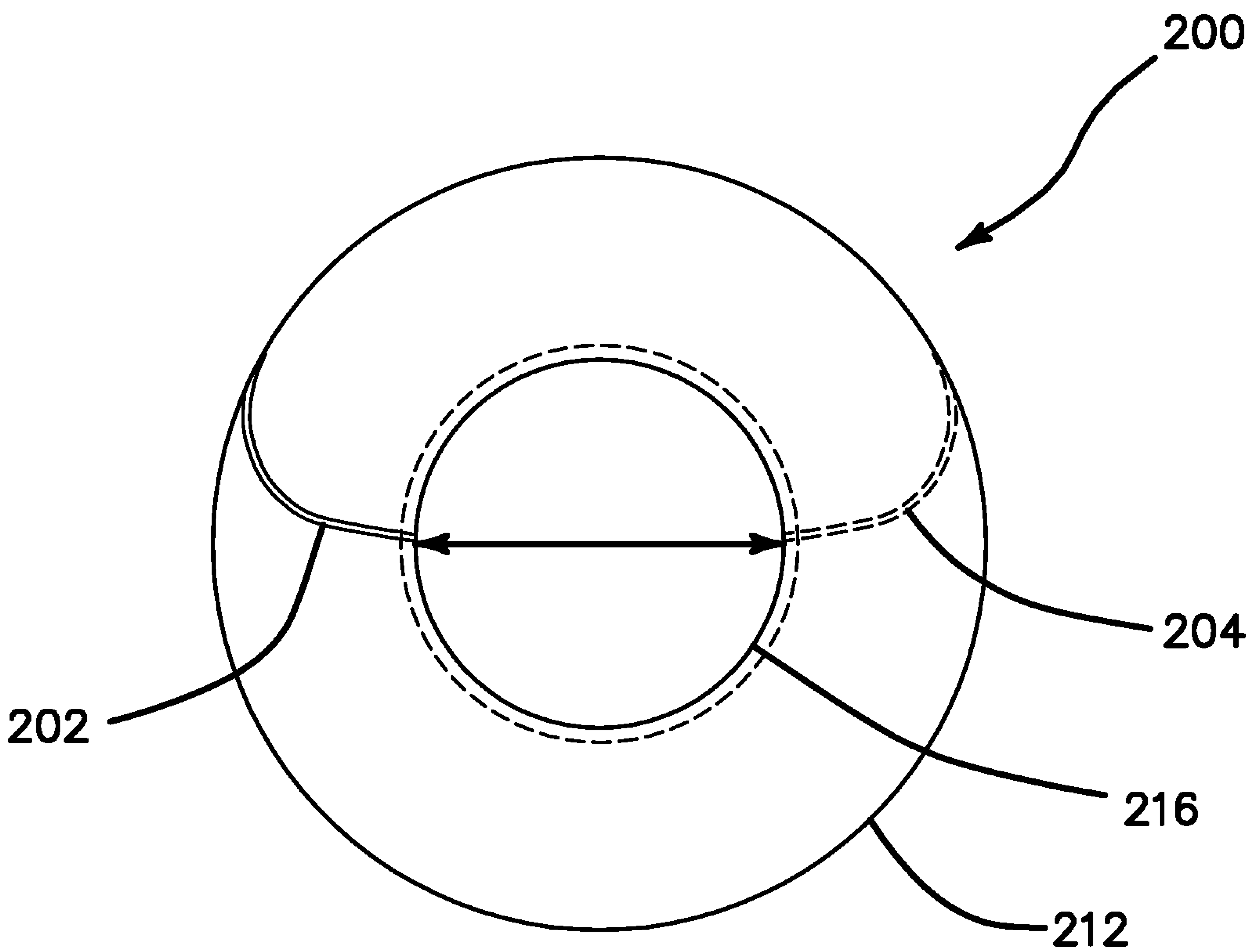

FIG. 78A

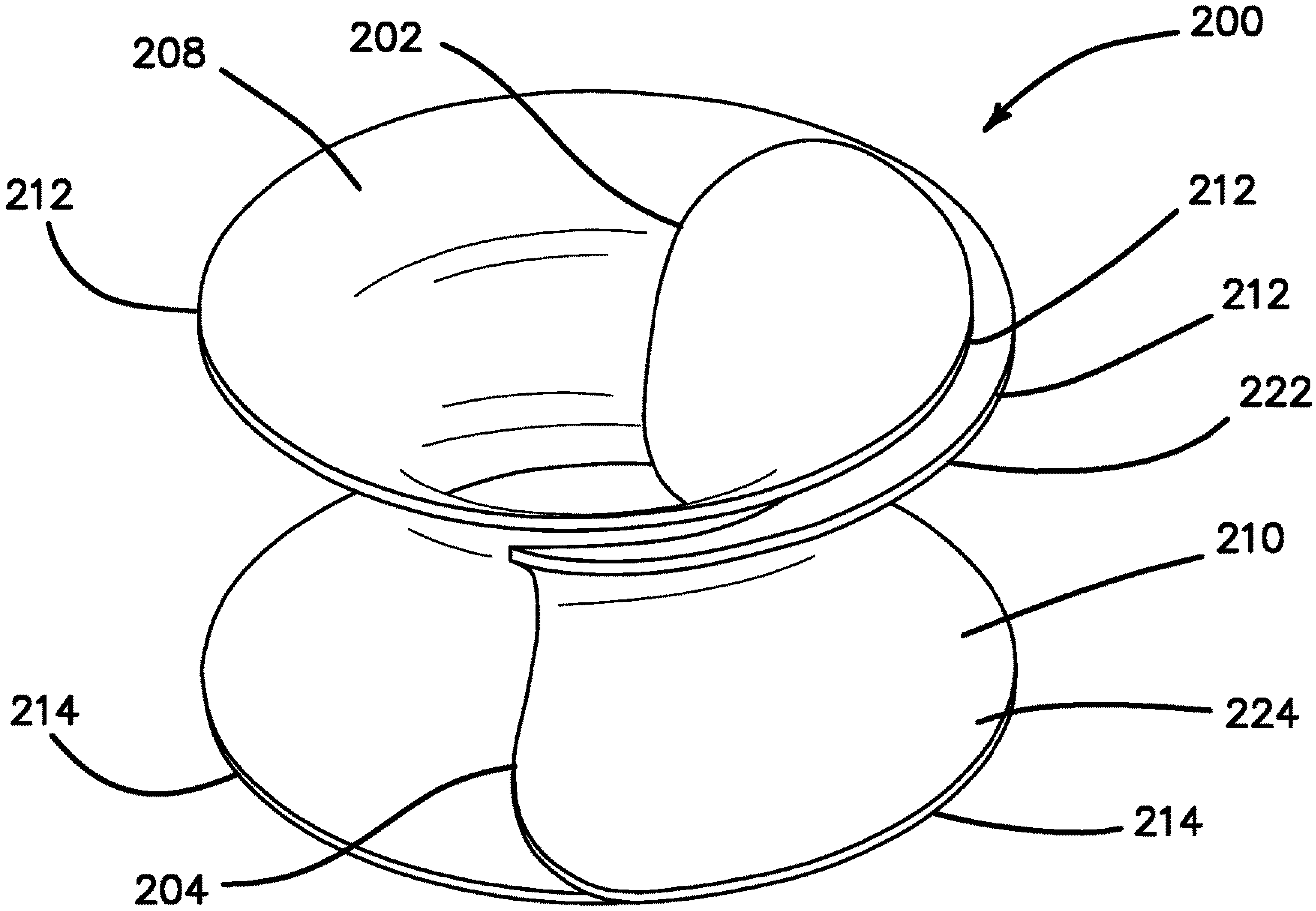
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FIG. 76

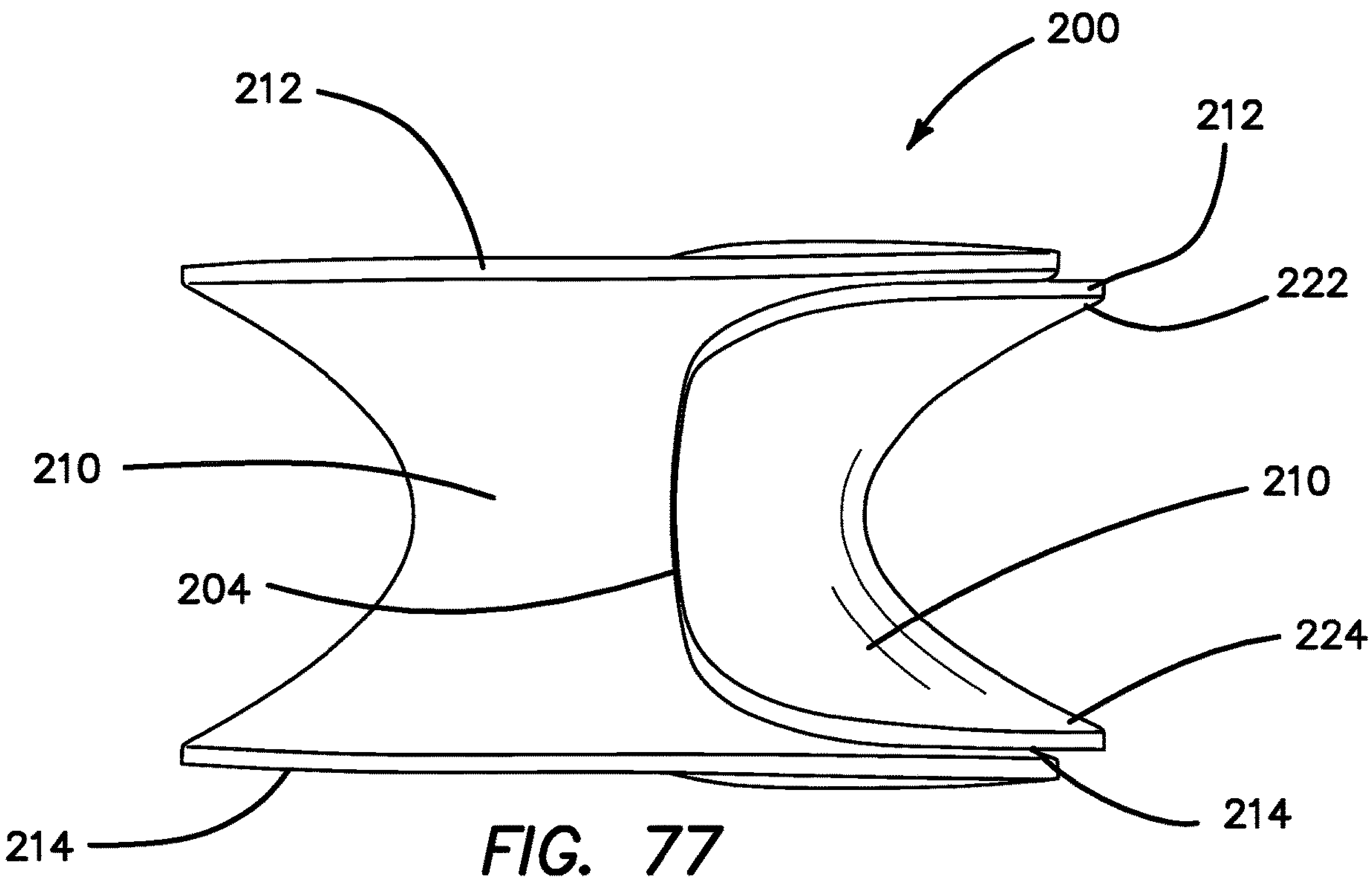
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FIG. 77

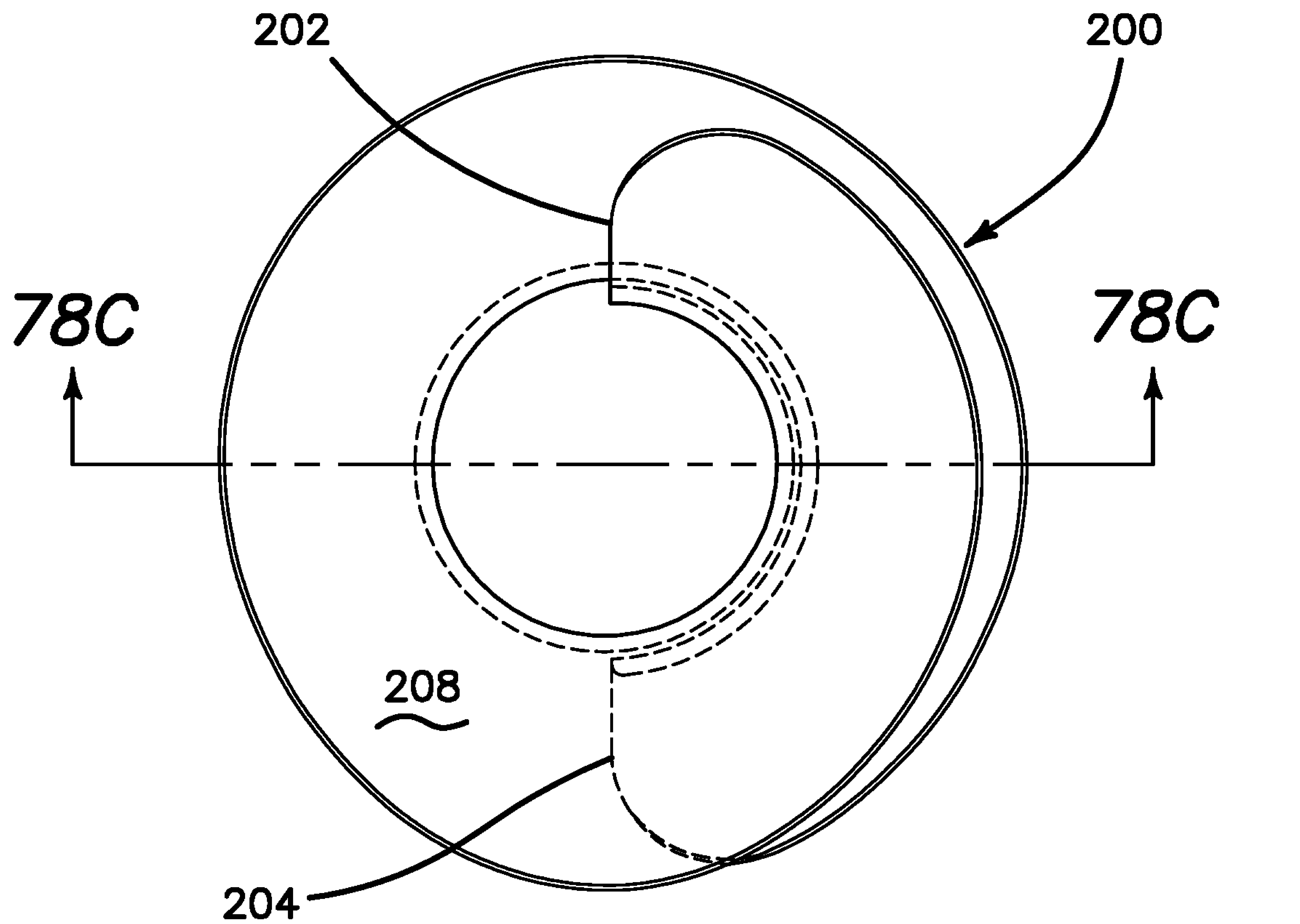

FIG. 78B

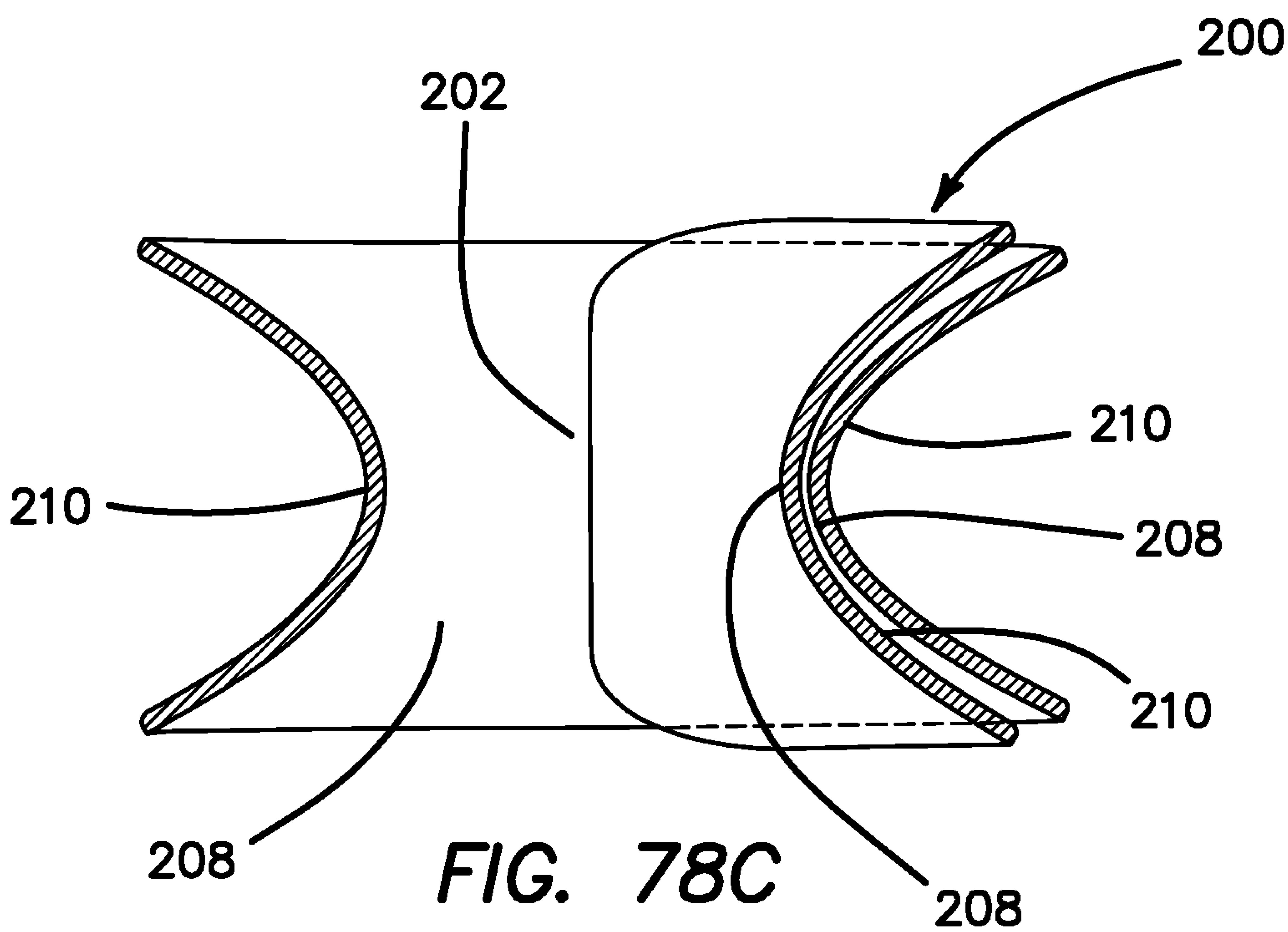

FIG. 78C

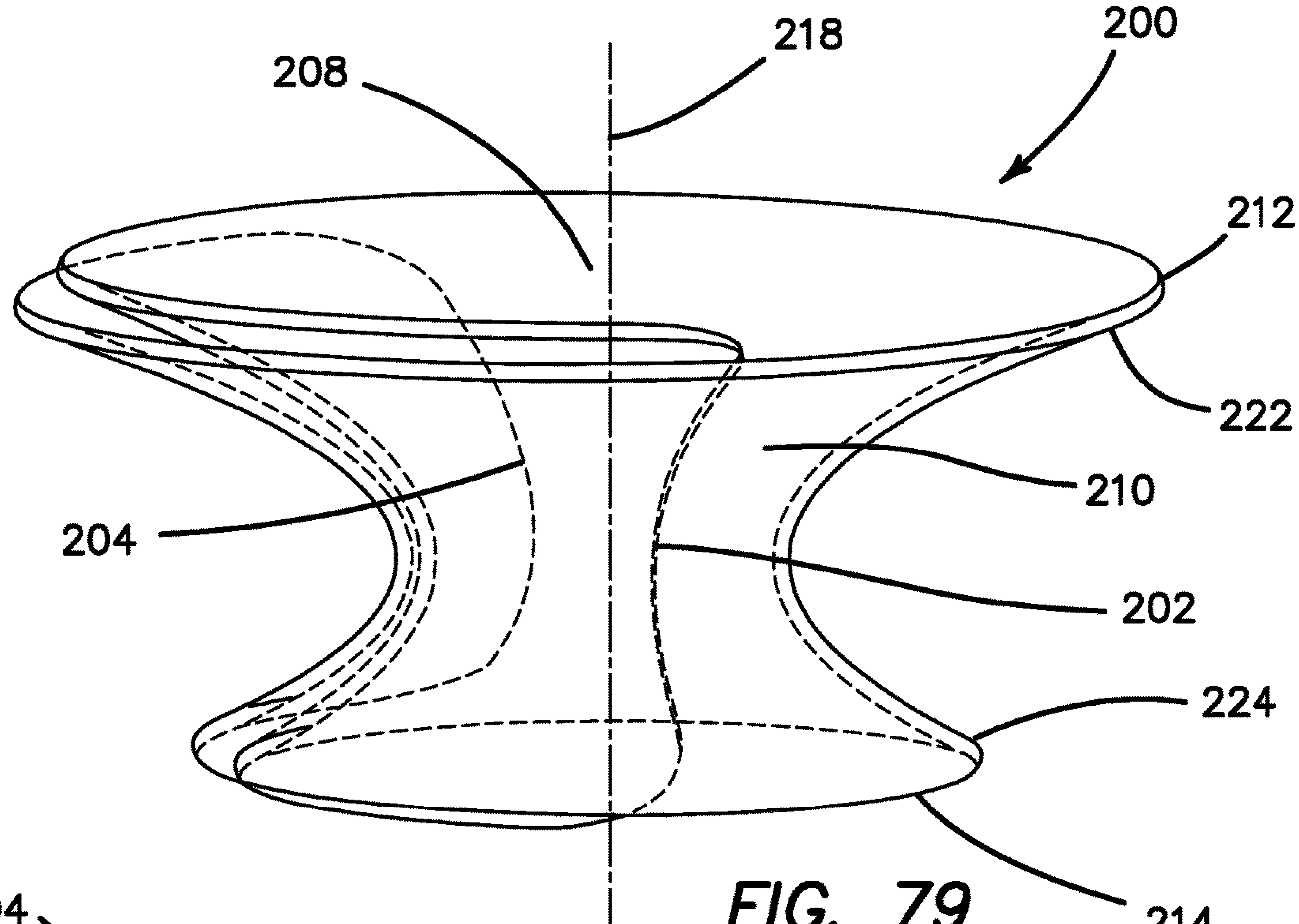

FIG. 79

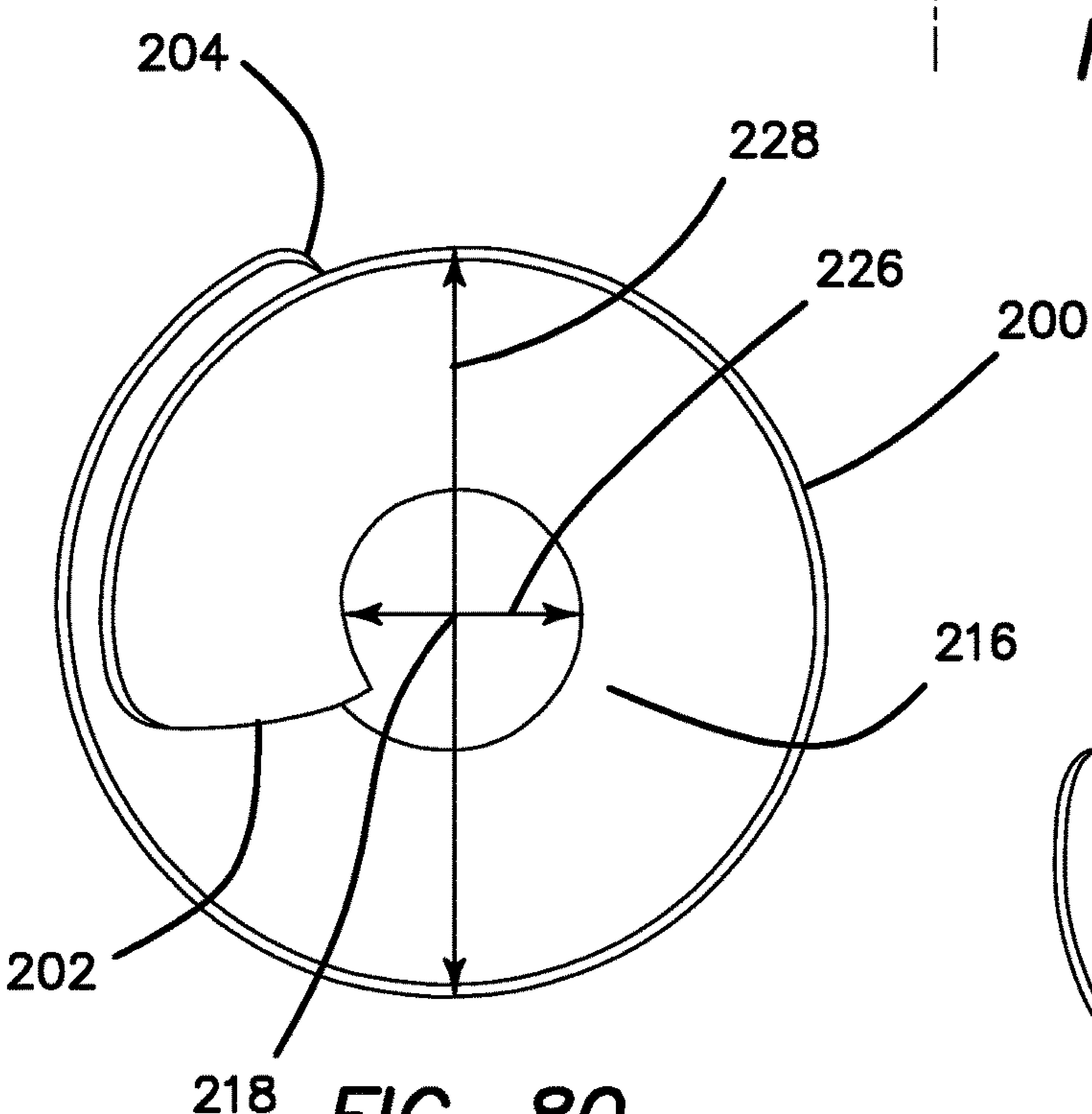

FIG. 80

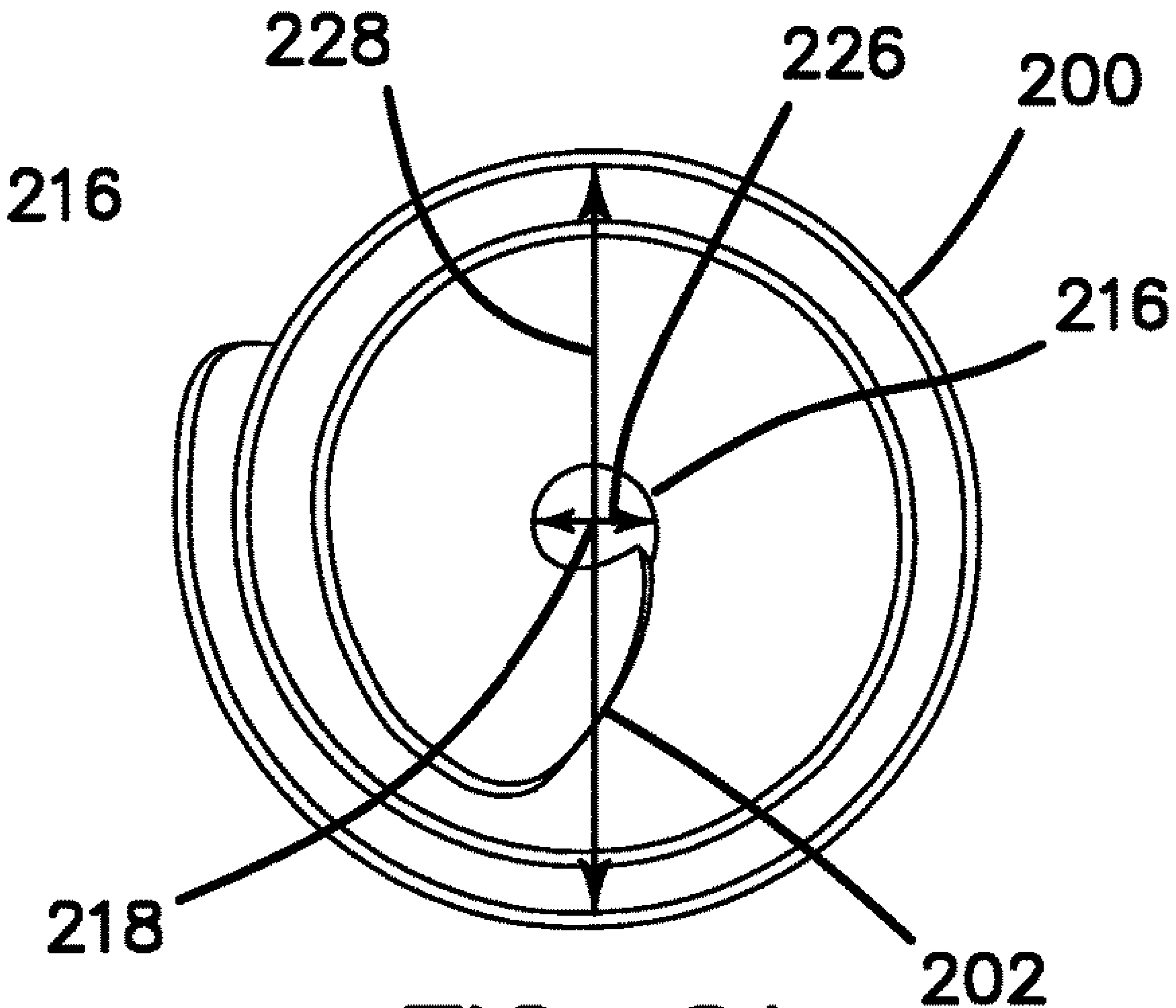

FIG. 81

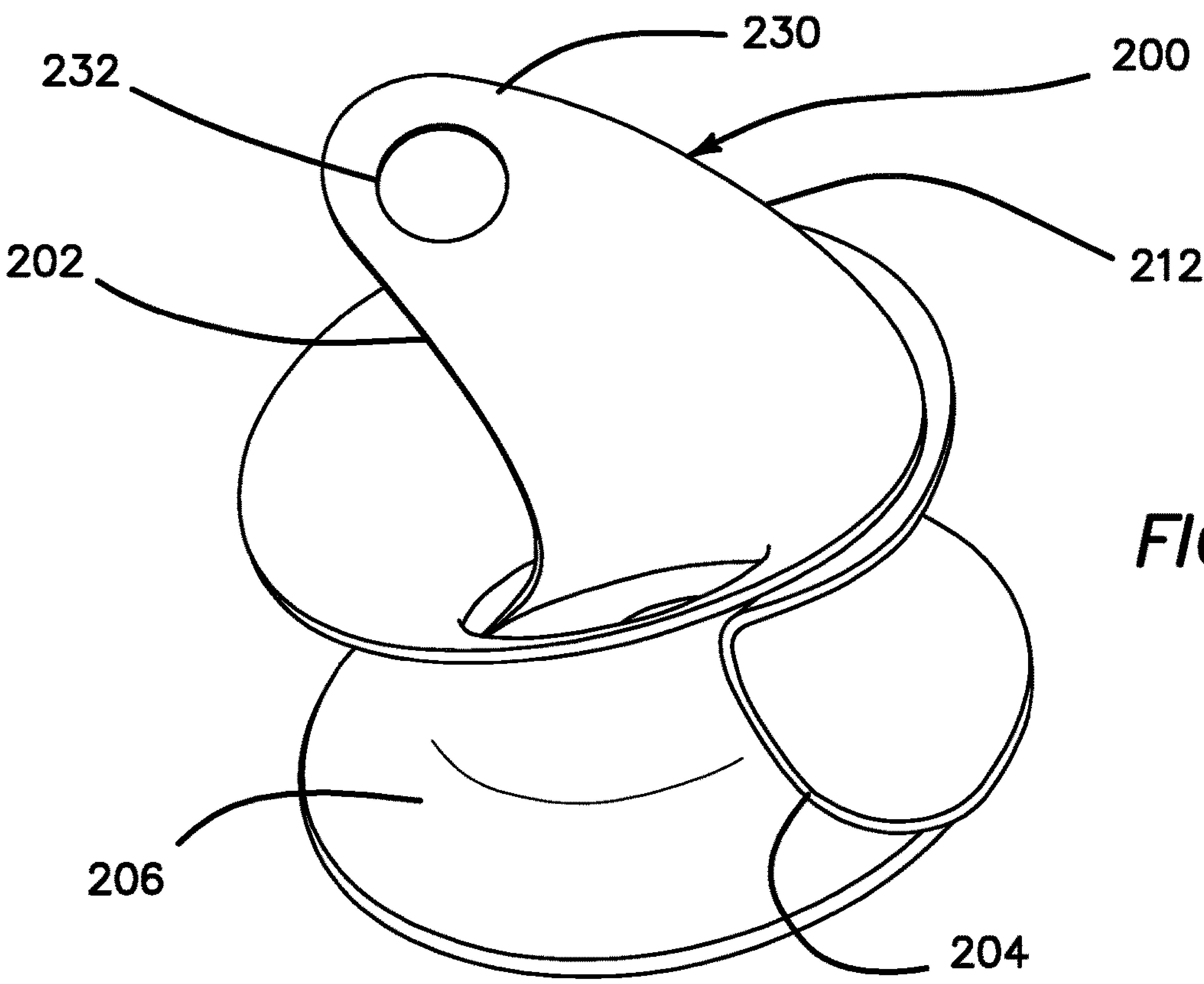

FIG. 82

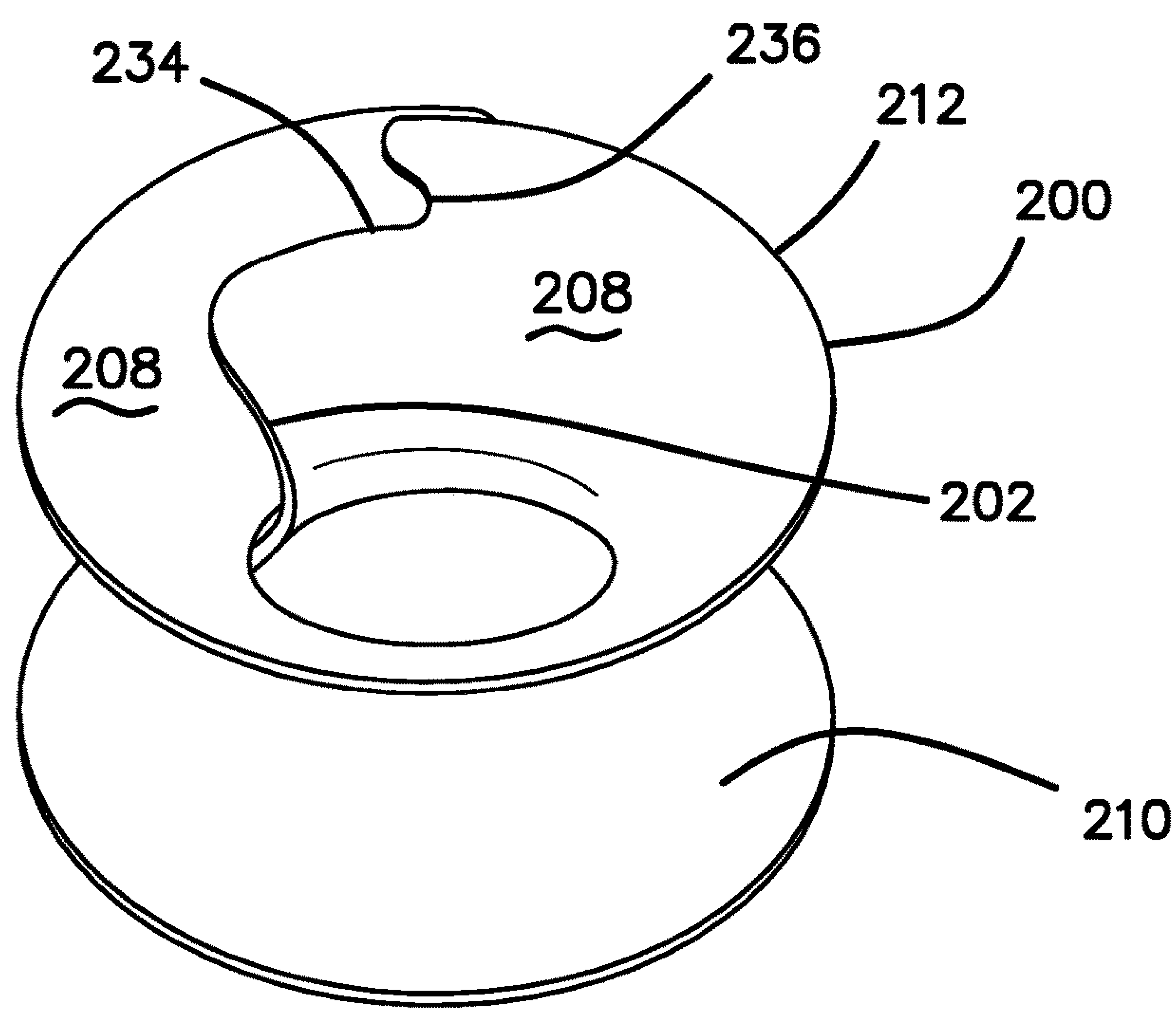

FIG. 83

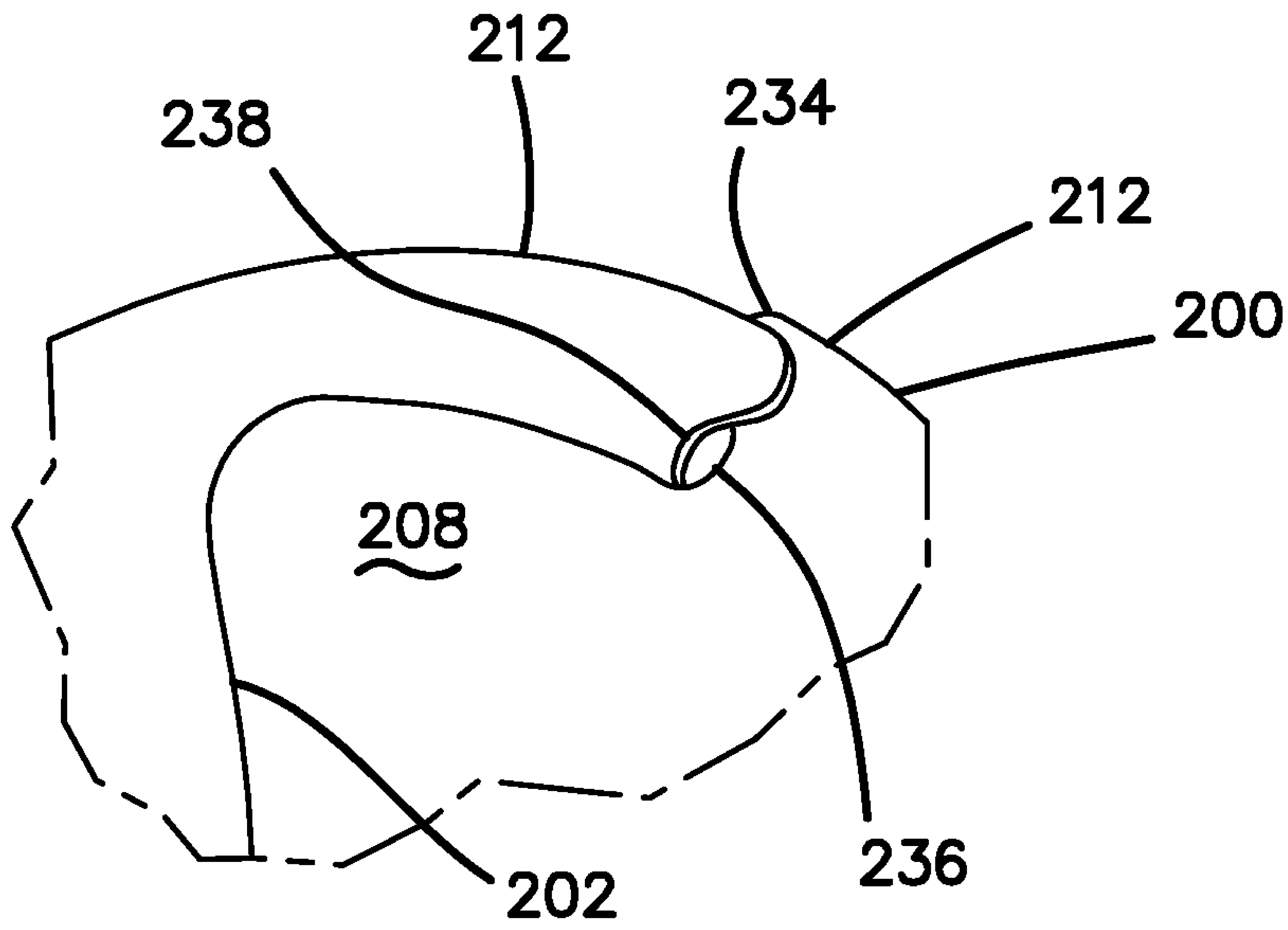
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FIG. 84

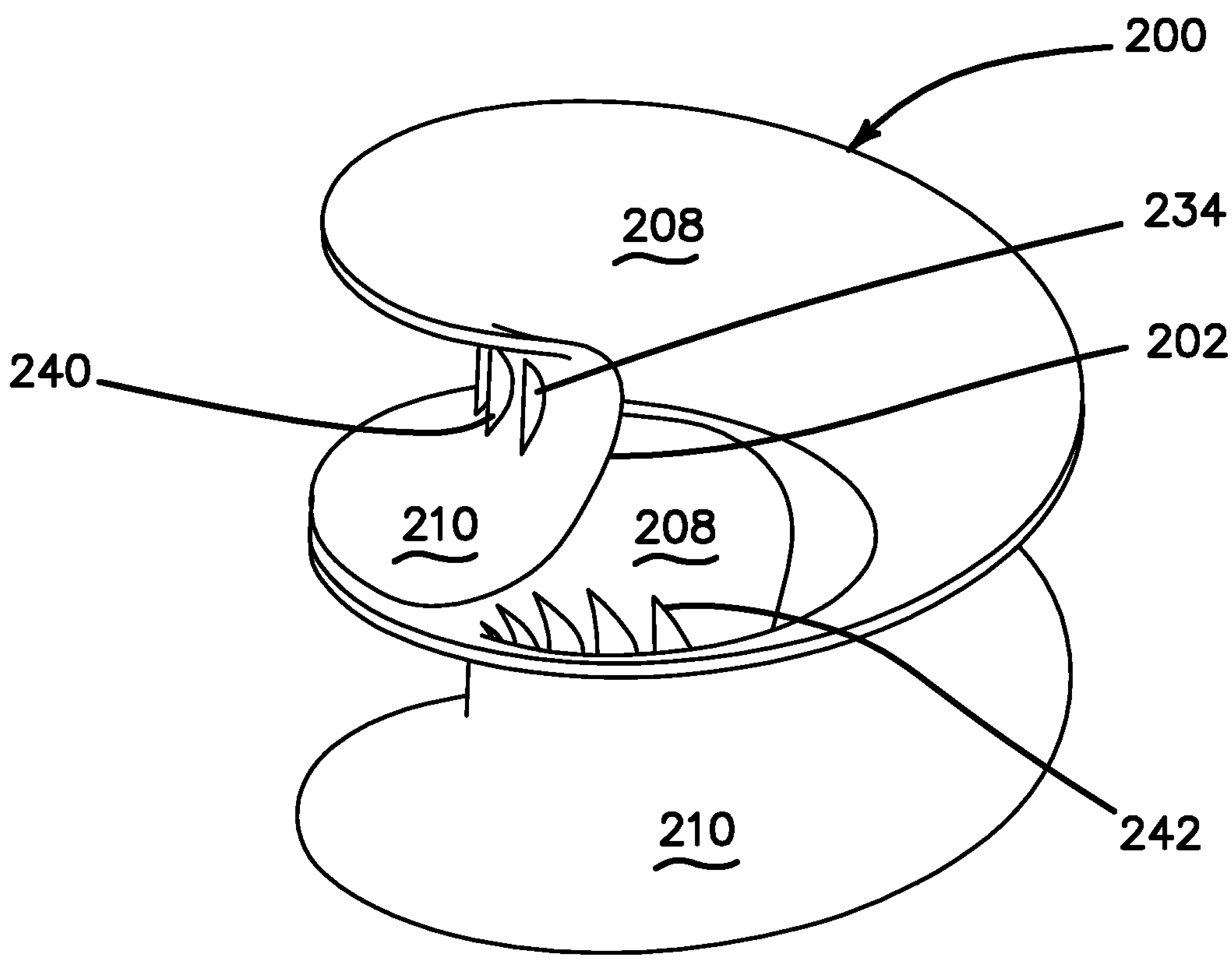
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FIG. 85

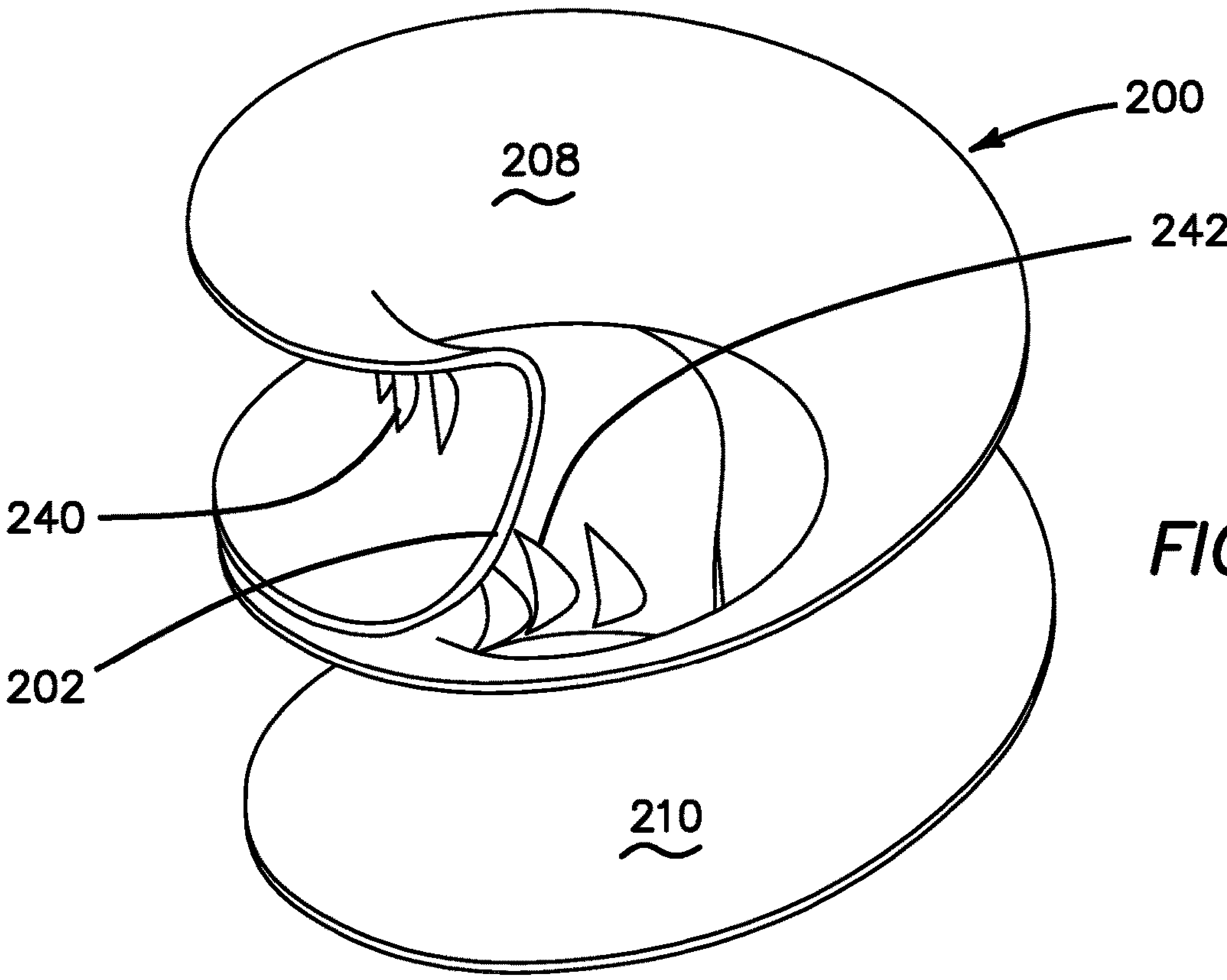


FIG. 86

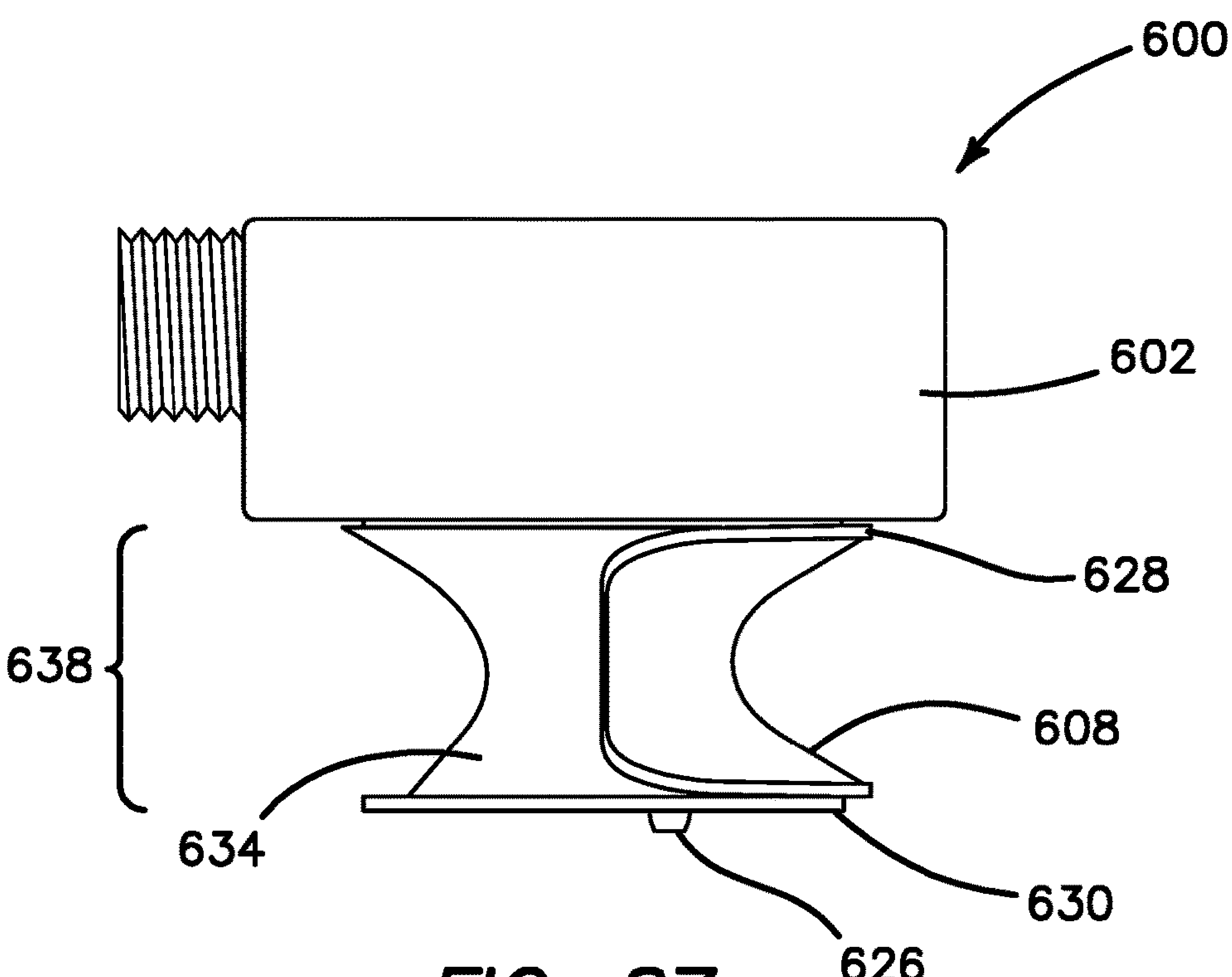
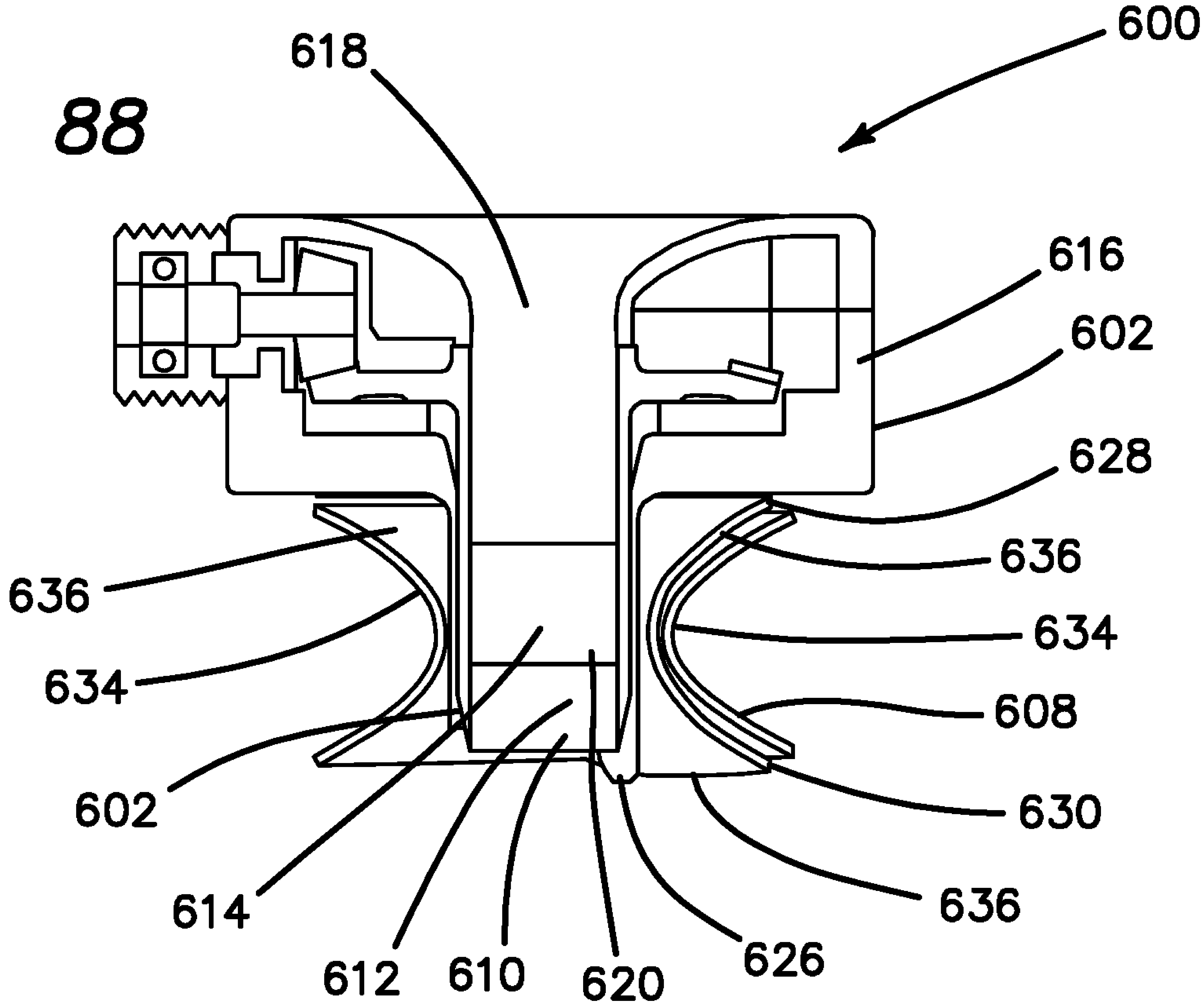


FIG. 87

FIG. 88



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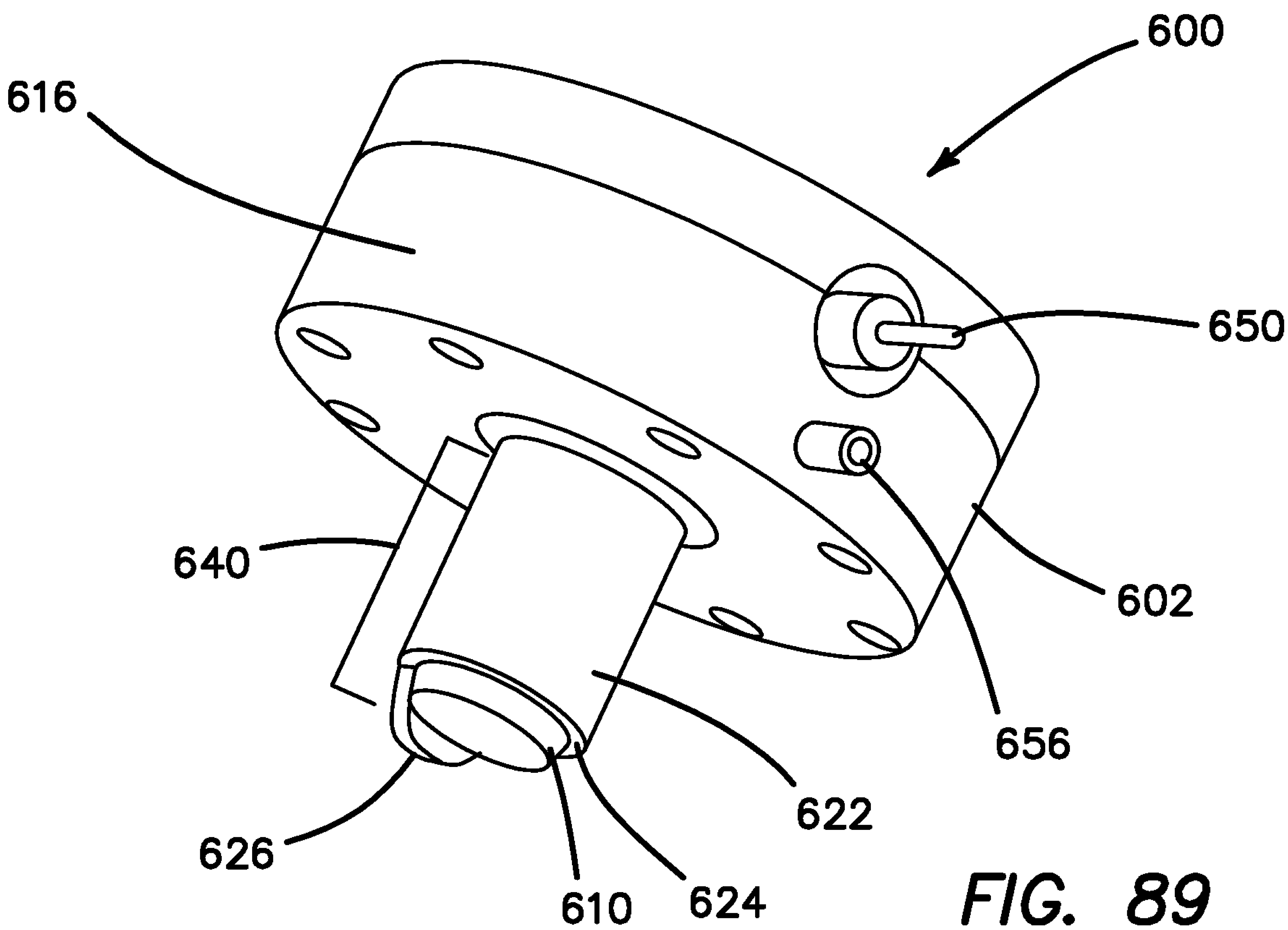

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FIG. 89

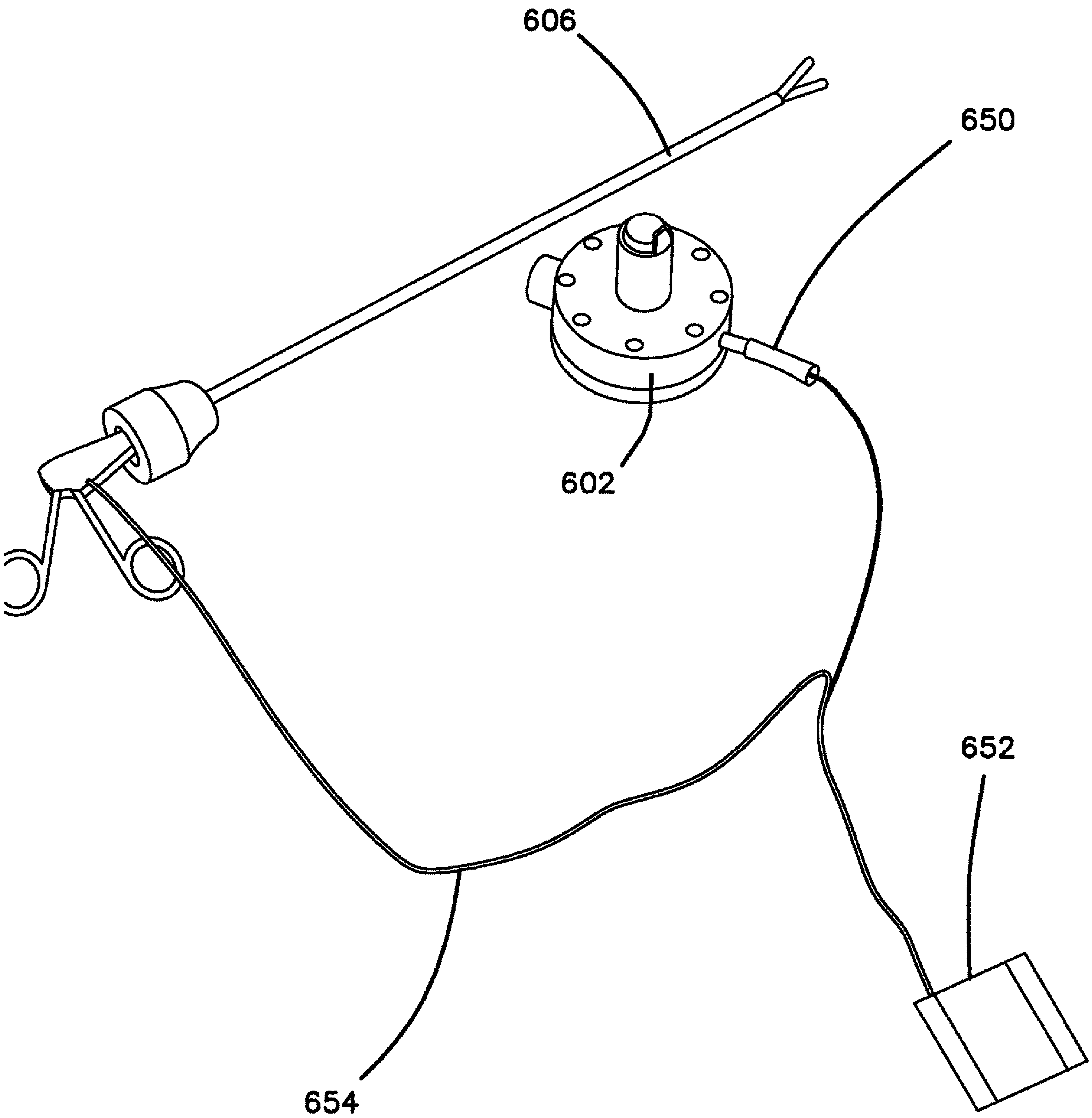

FIG. 90

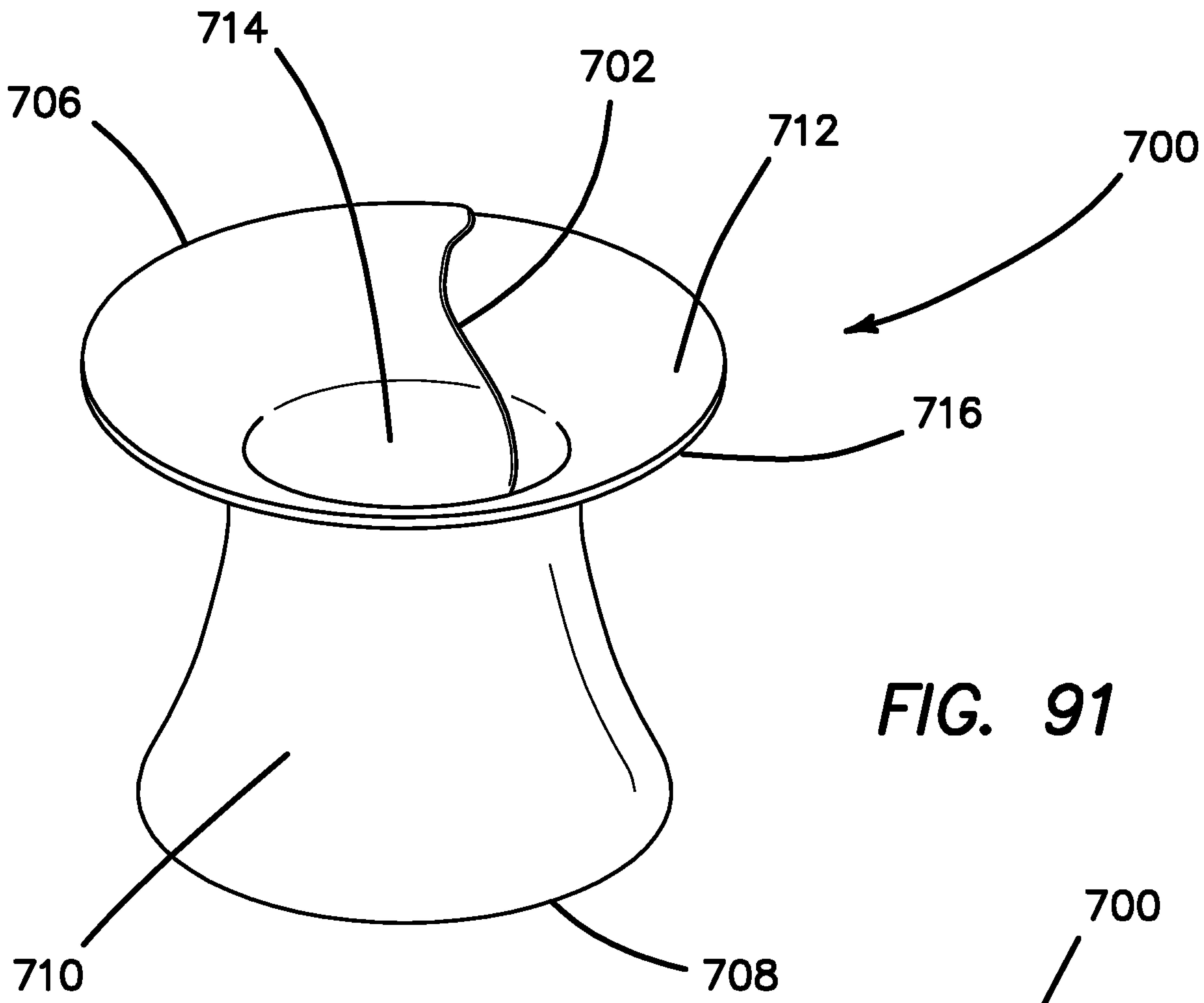

FIG. 91

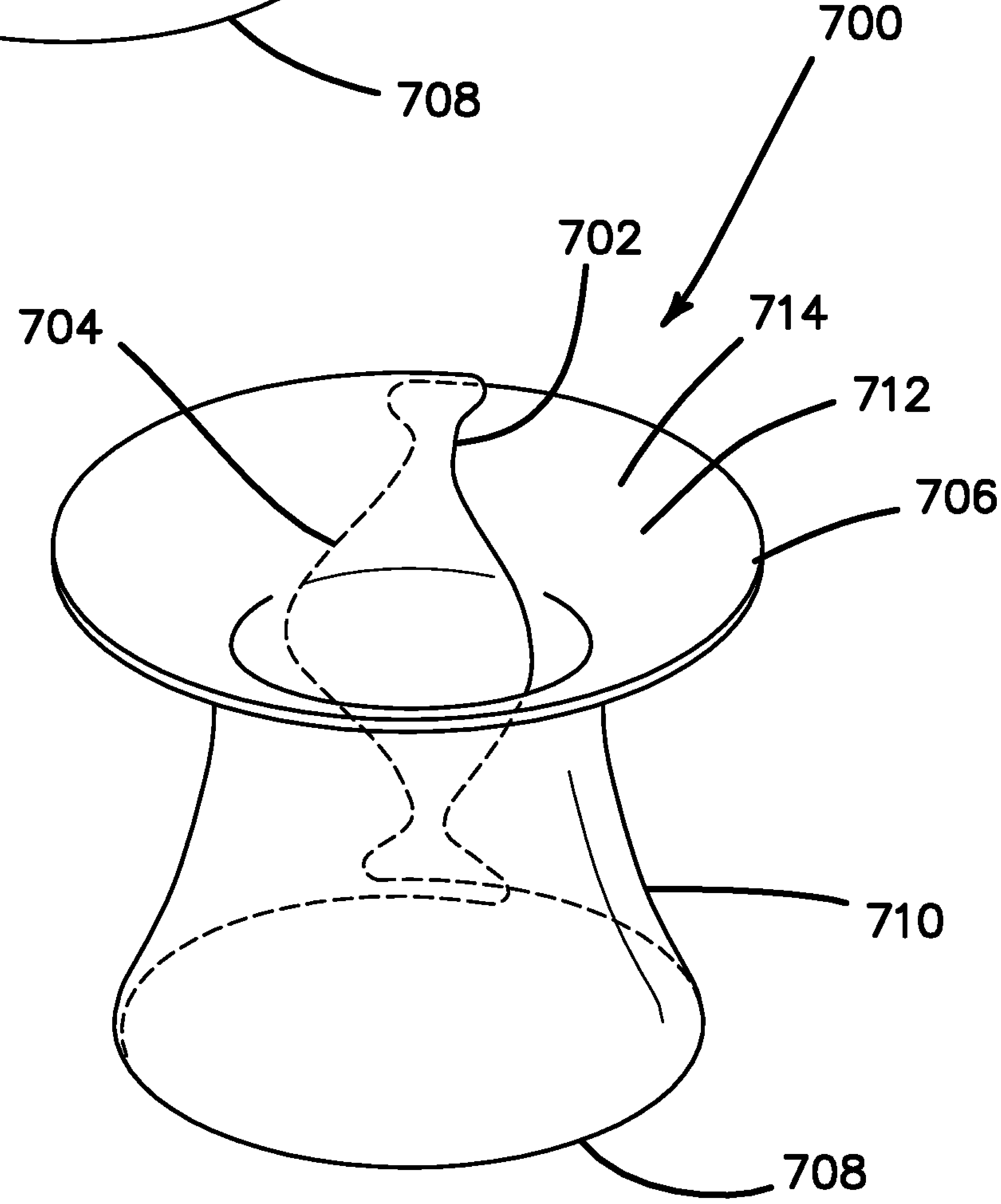

FIG. 92

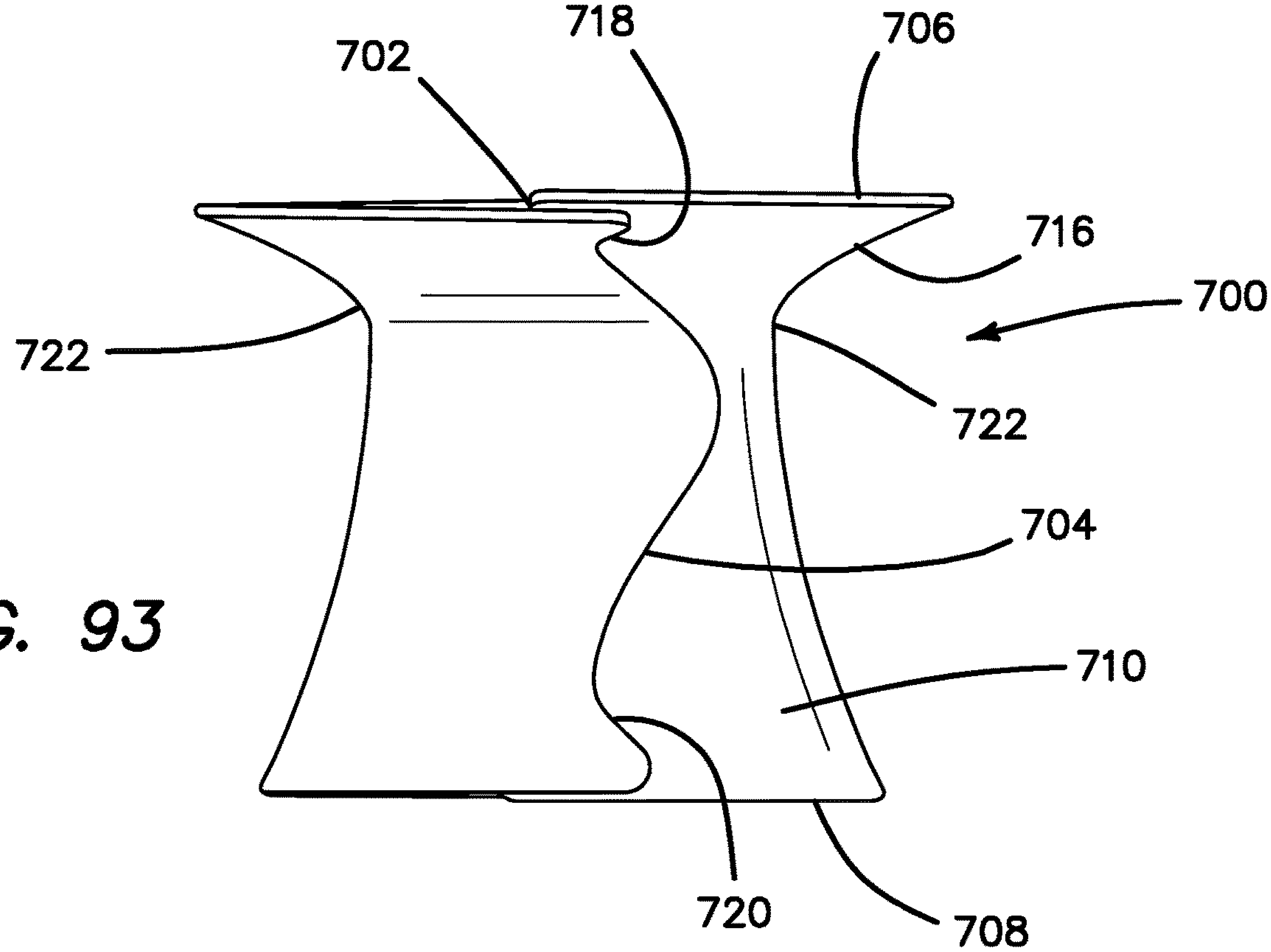
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FIG. 93

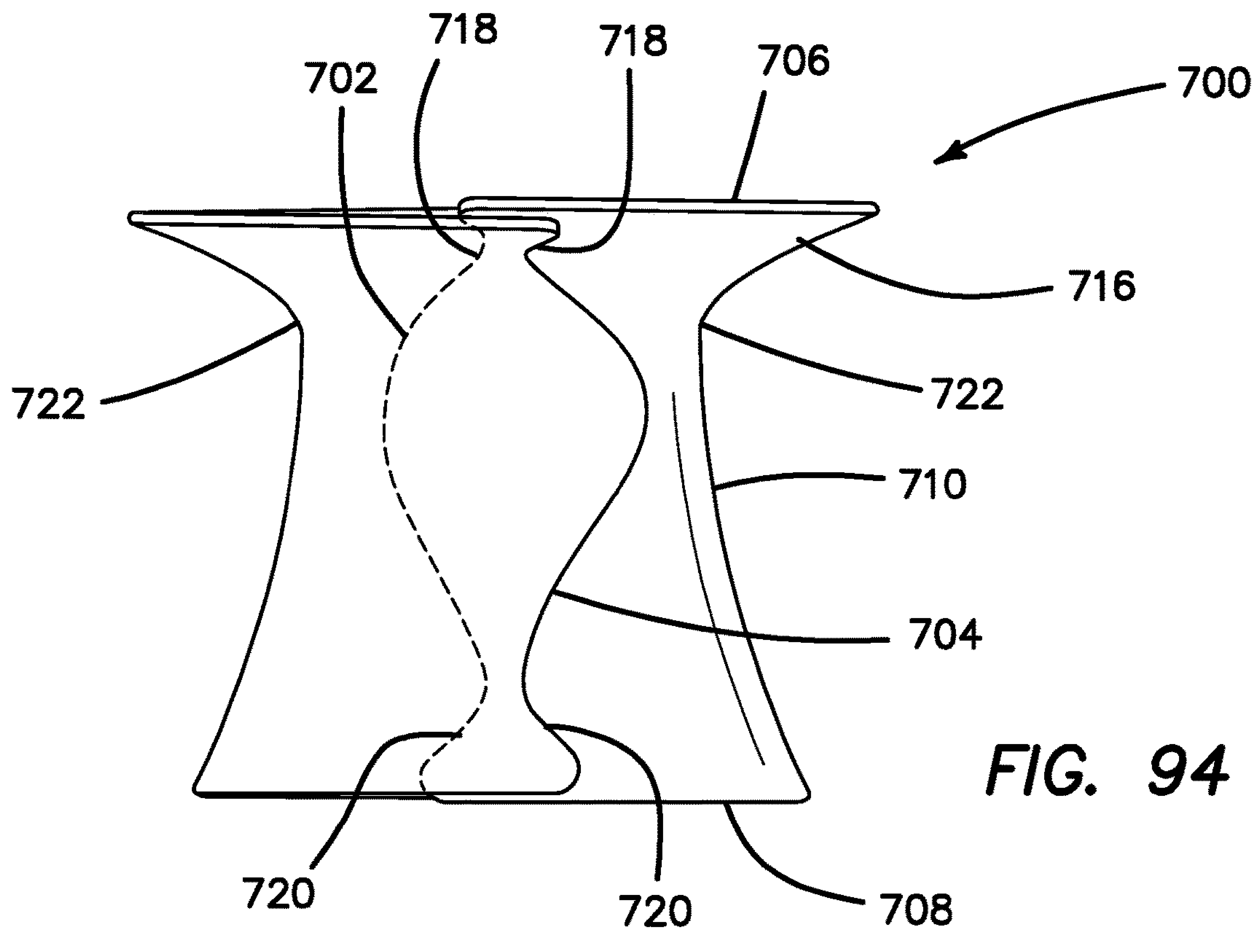
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FIG. 94

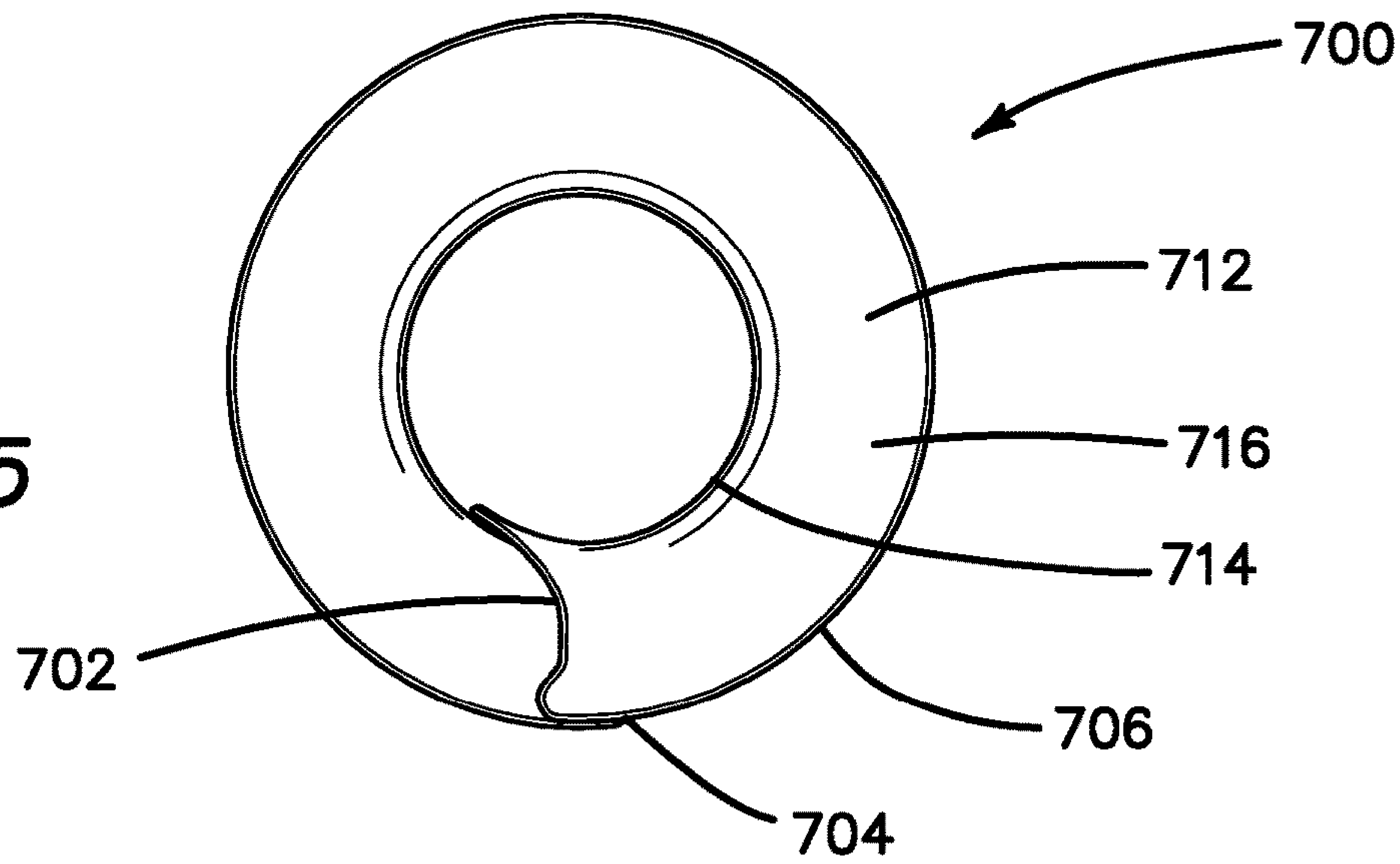


FIG. 95

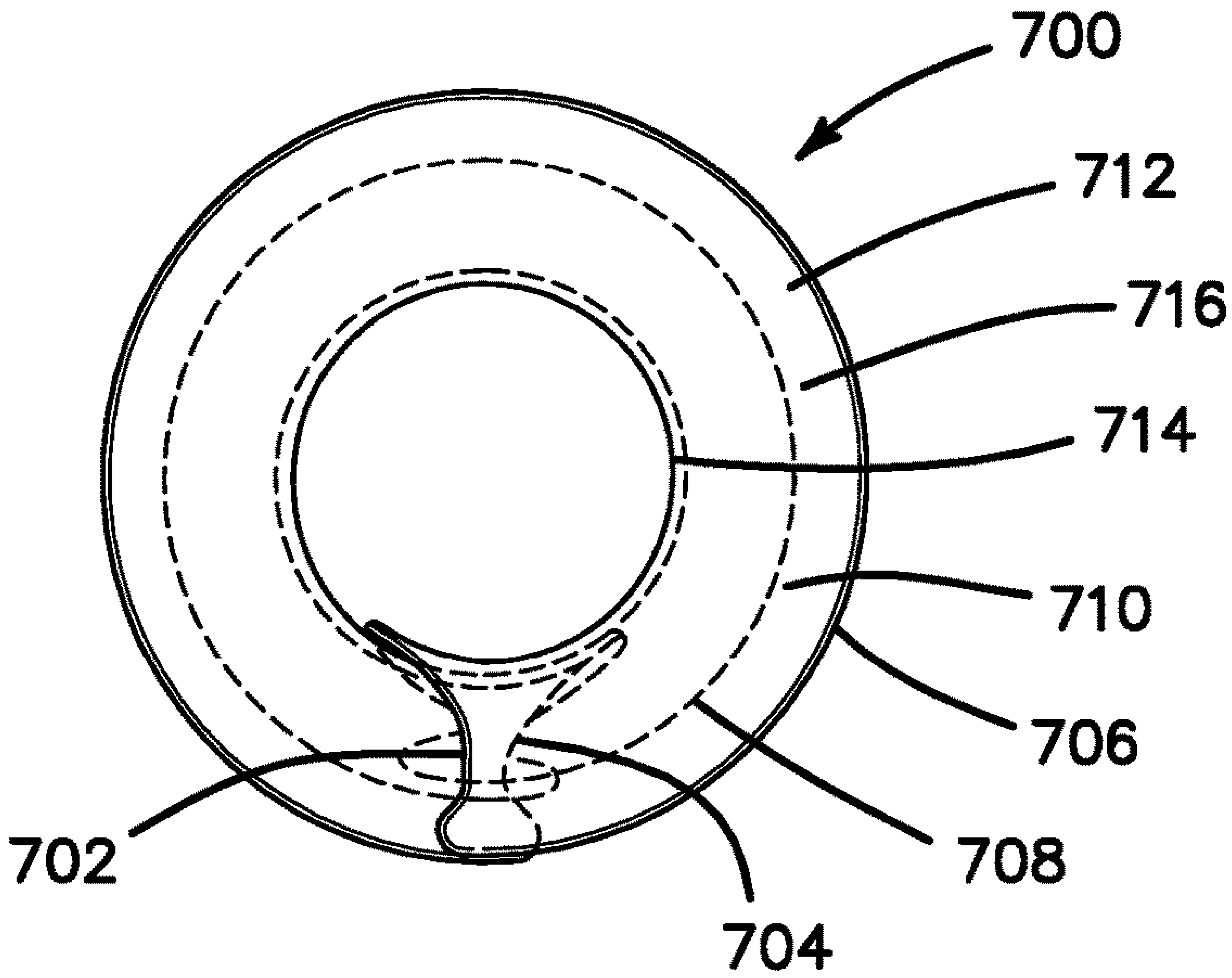


FIG. 96

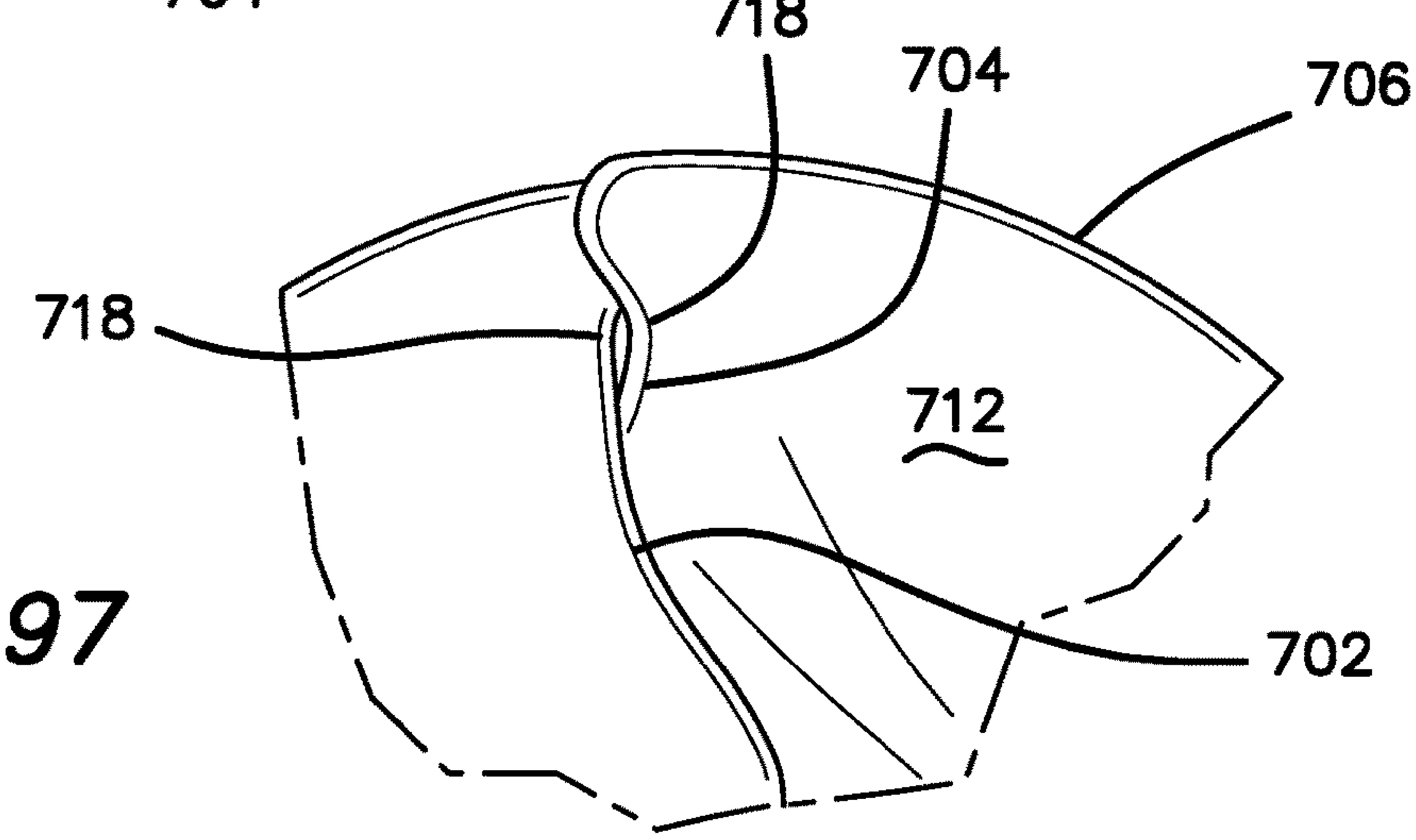


FIG. 97

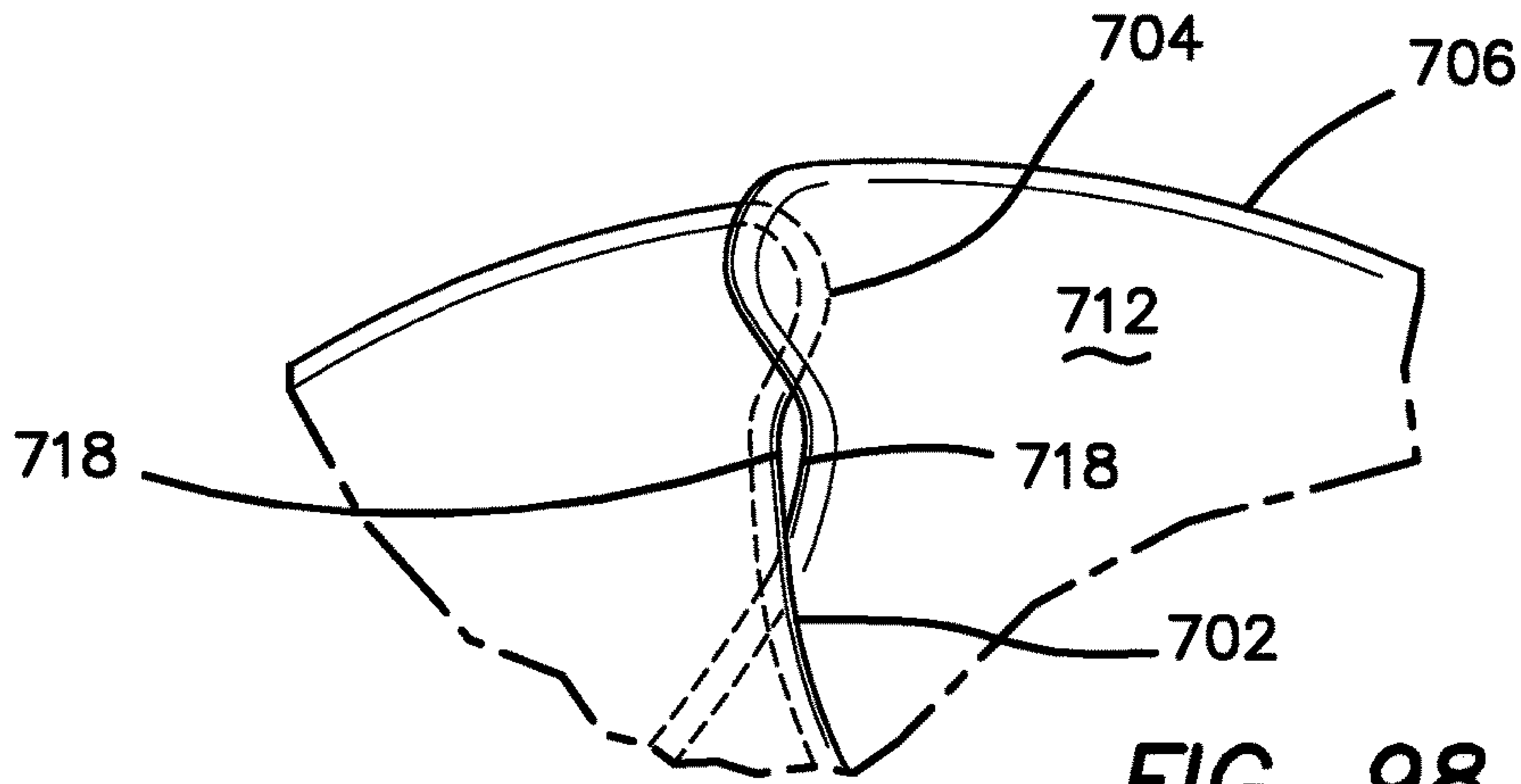


FIG. 98

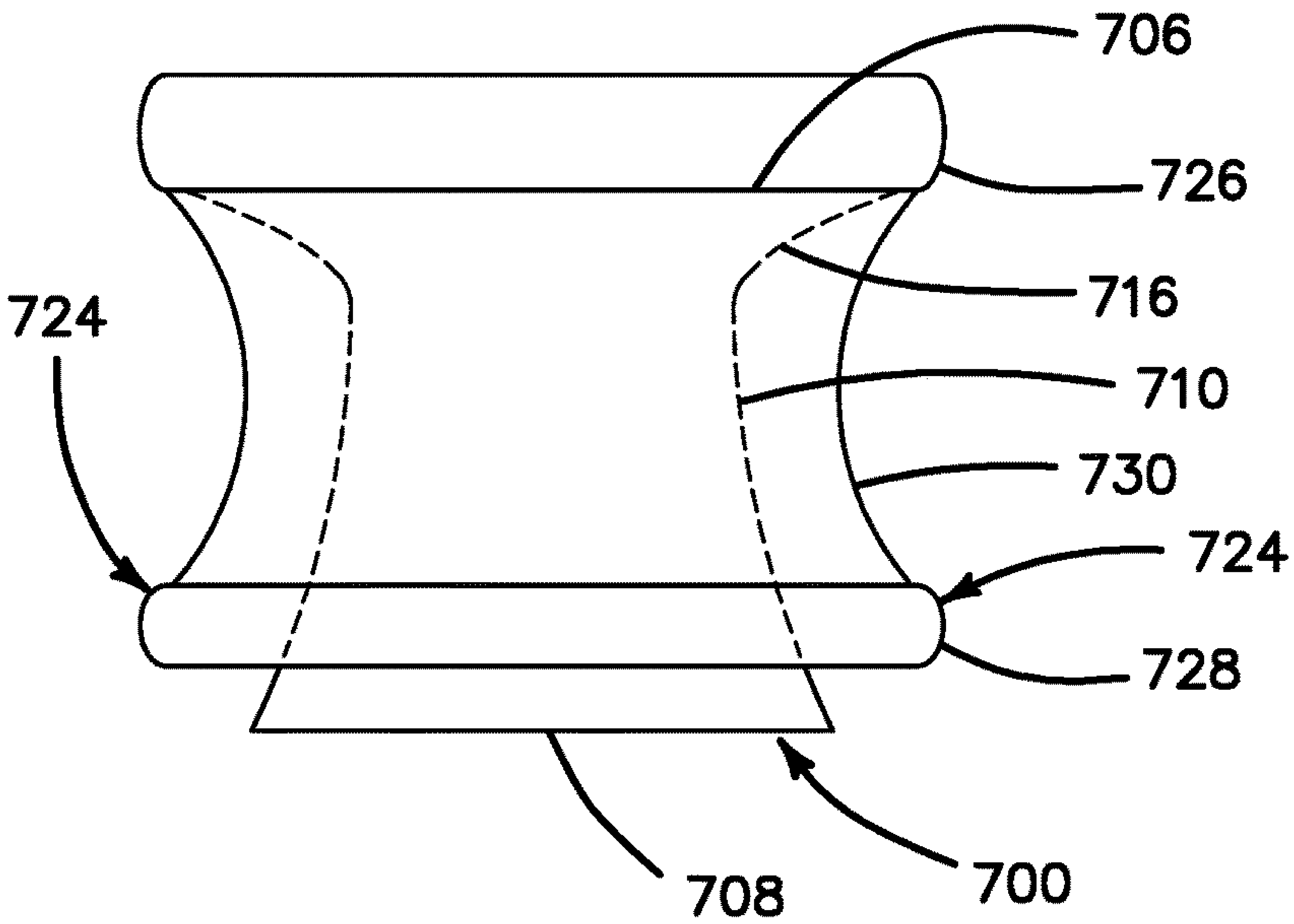


FIG. 99

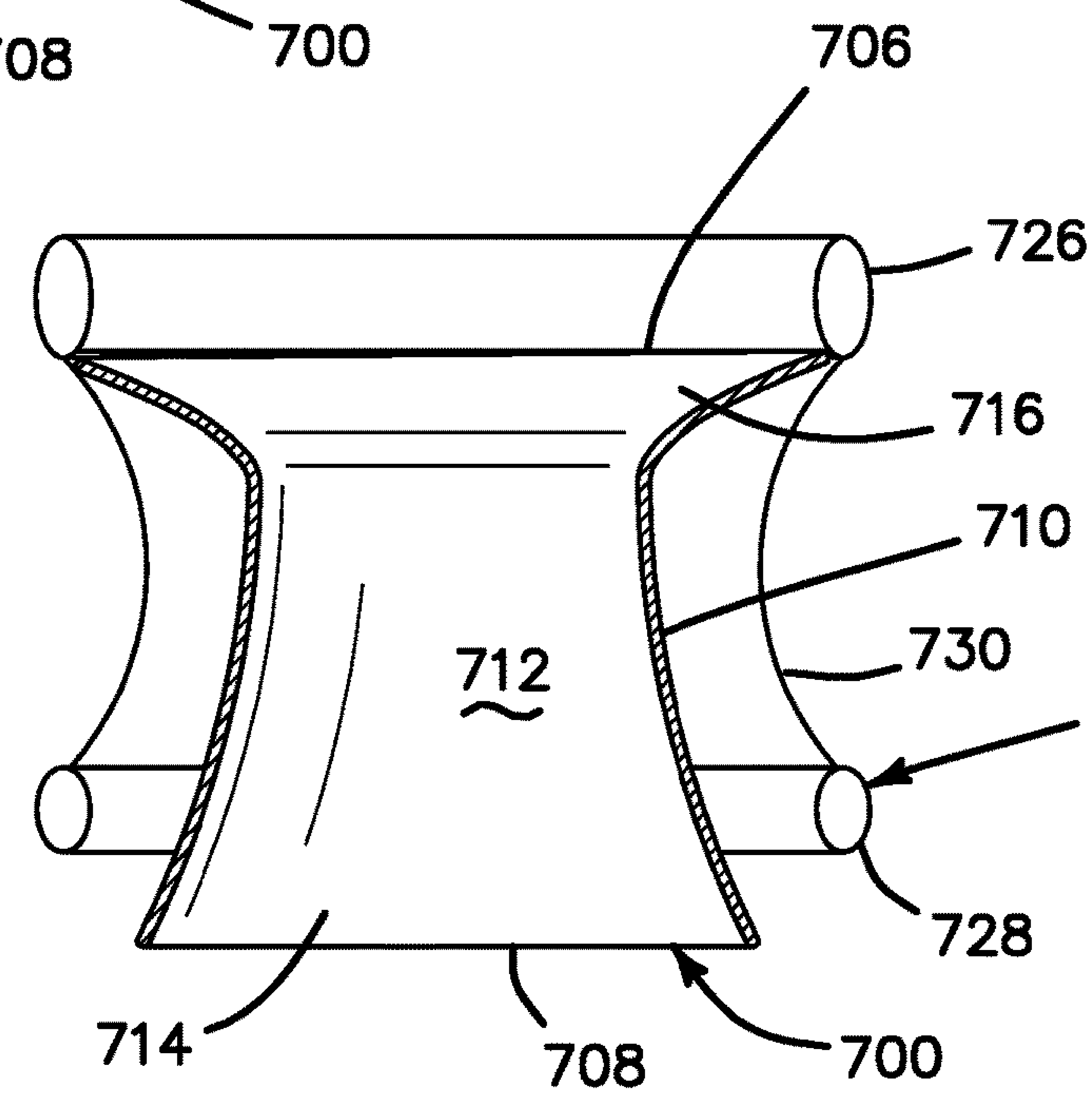


FIG. 100

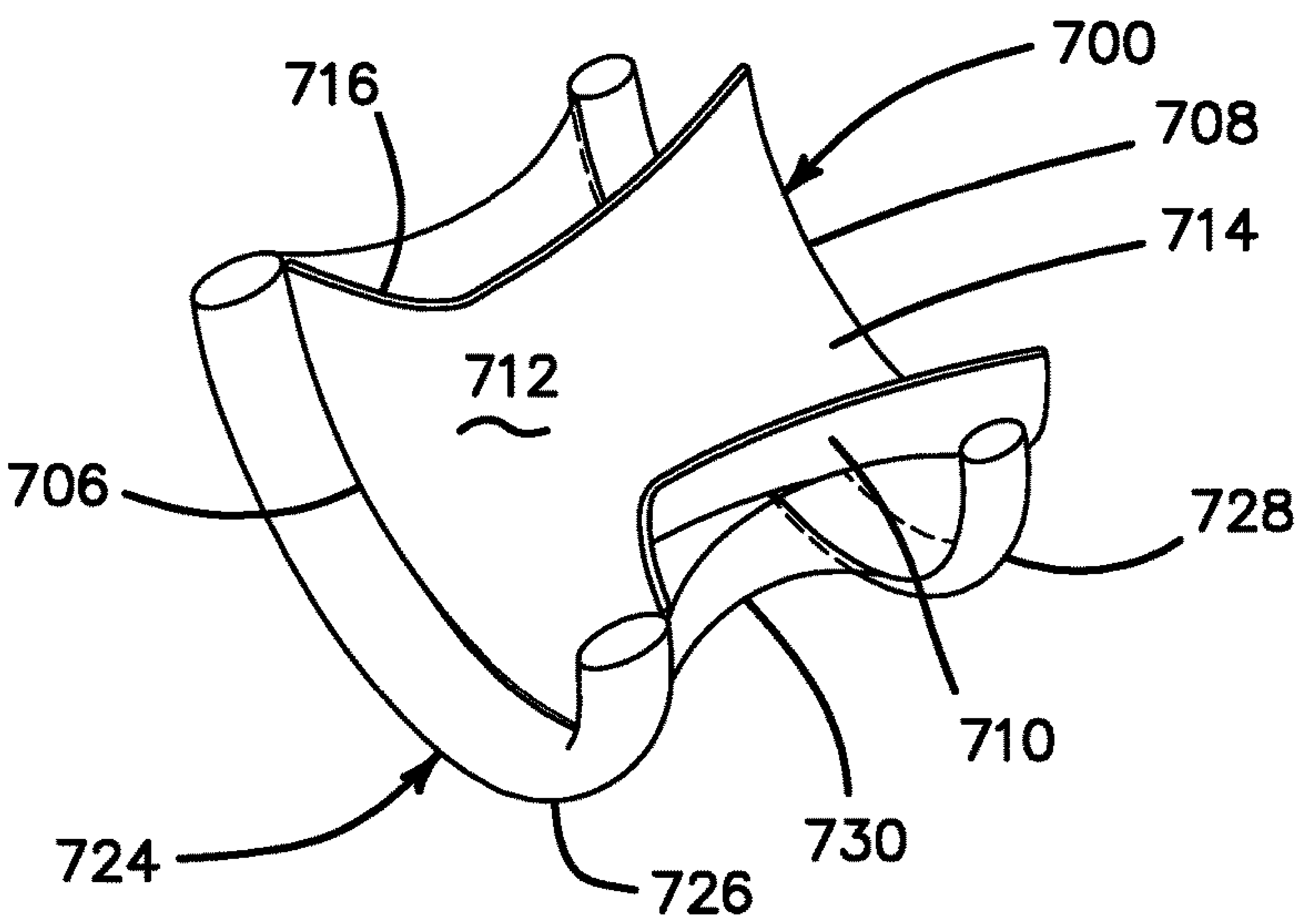


FIG. 101

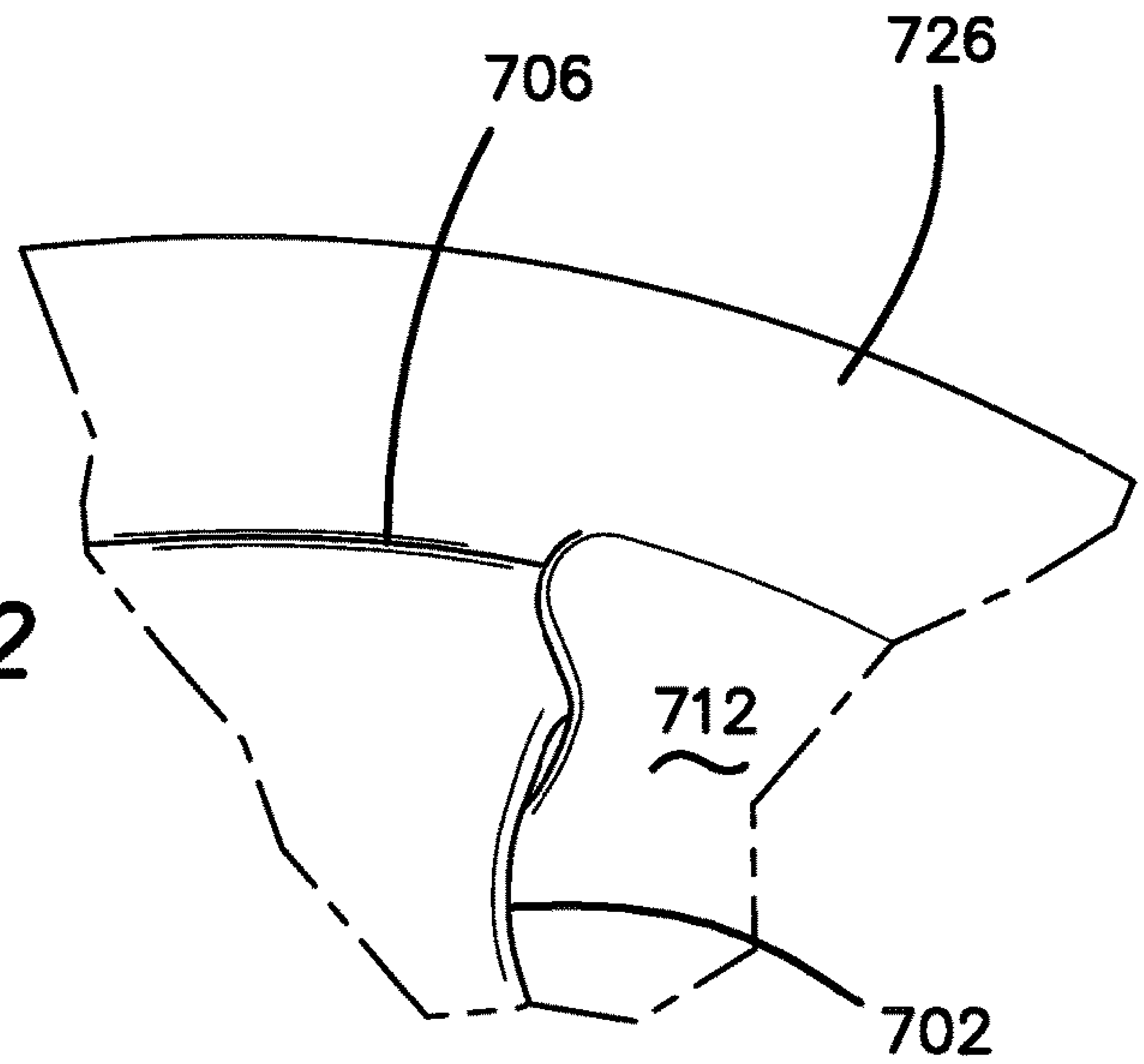


FIG. 102

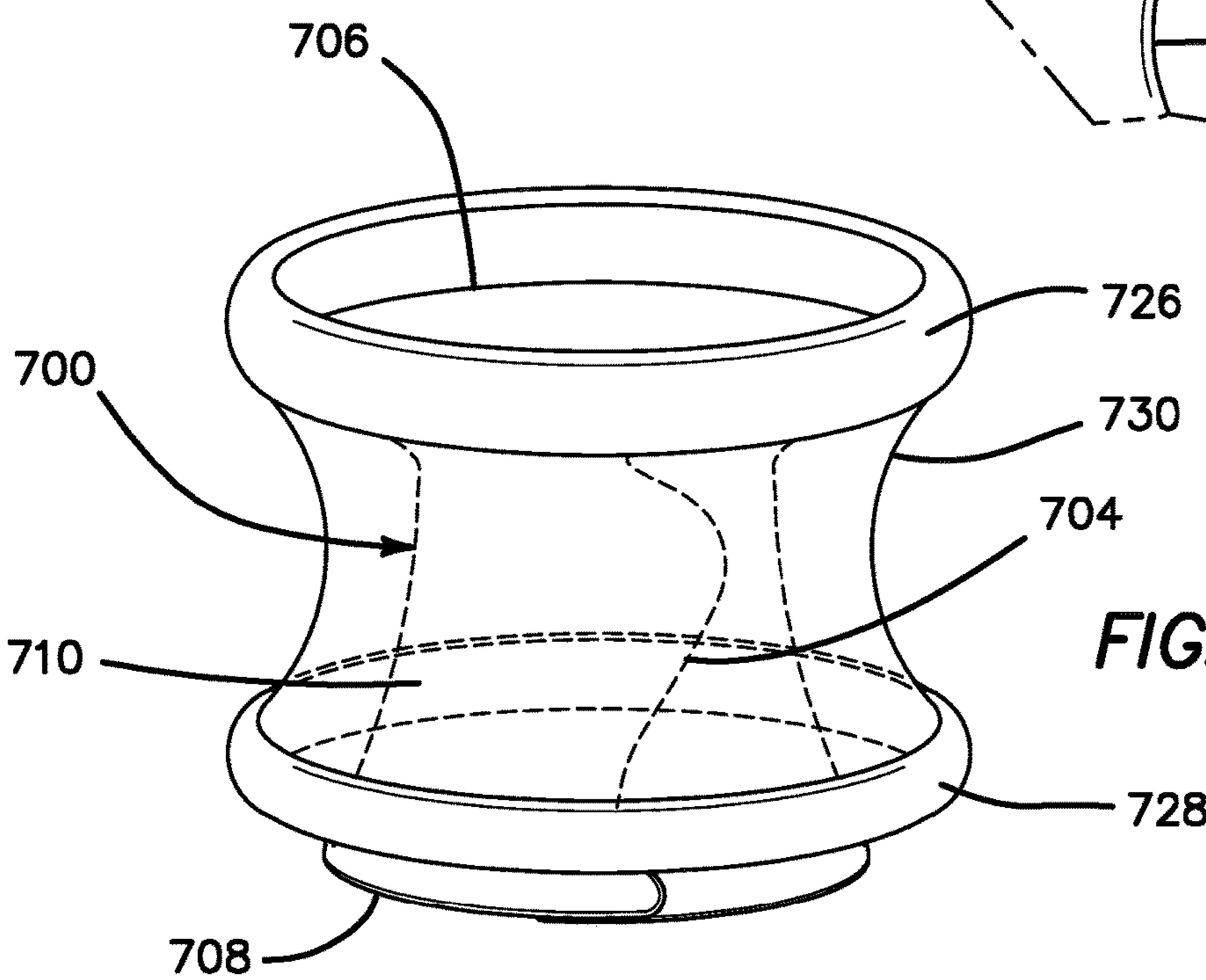


FIG. 103

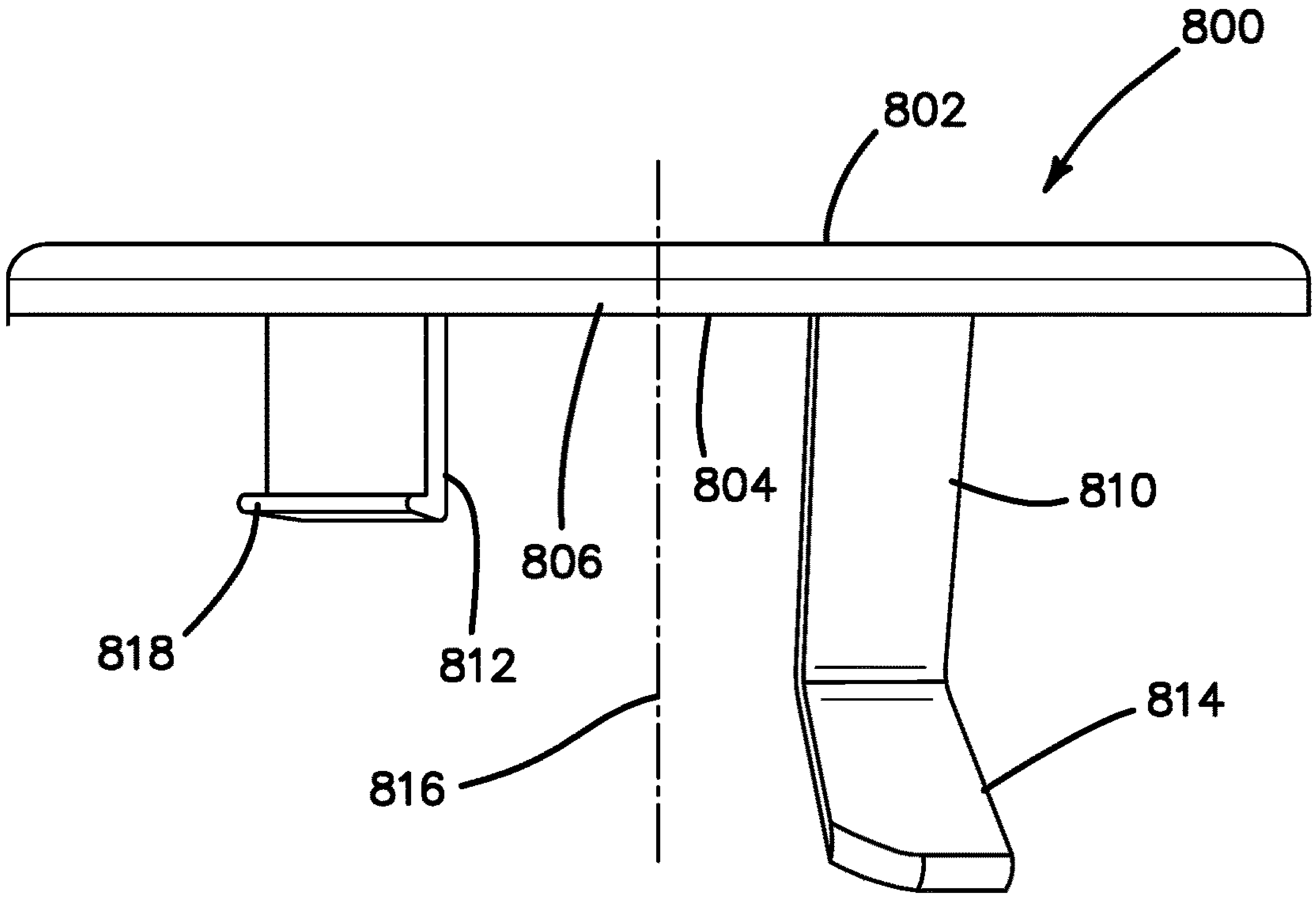


FIG. 104

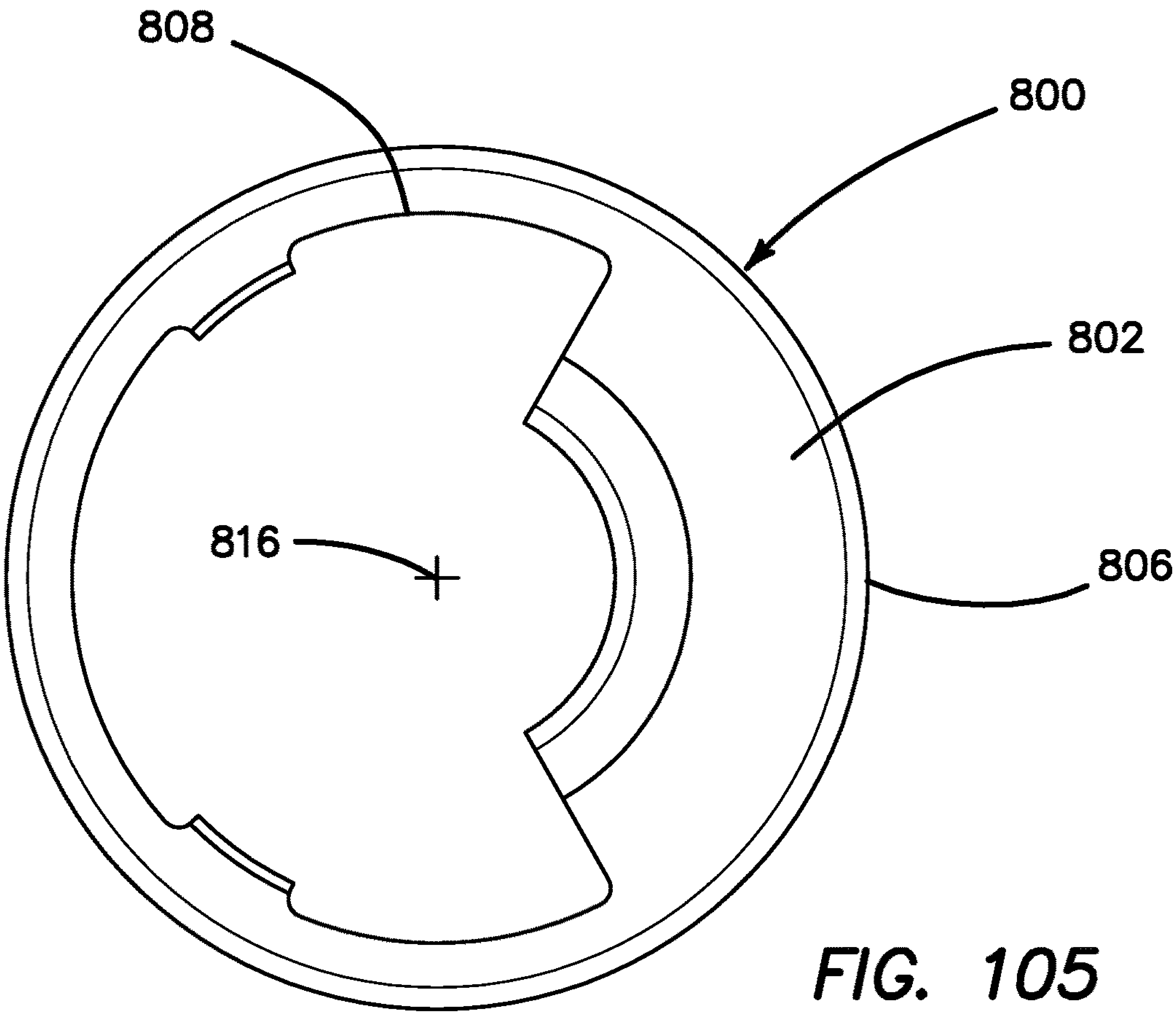


FIG. 105

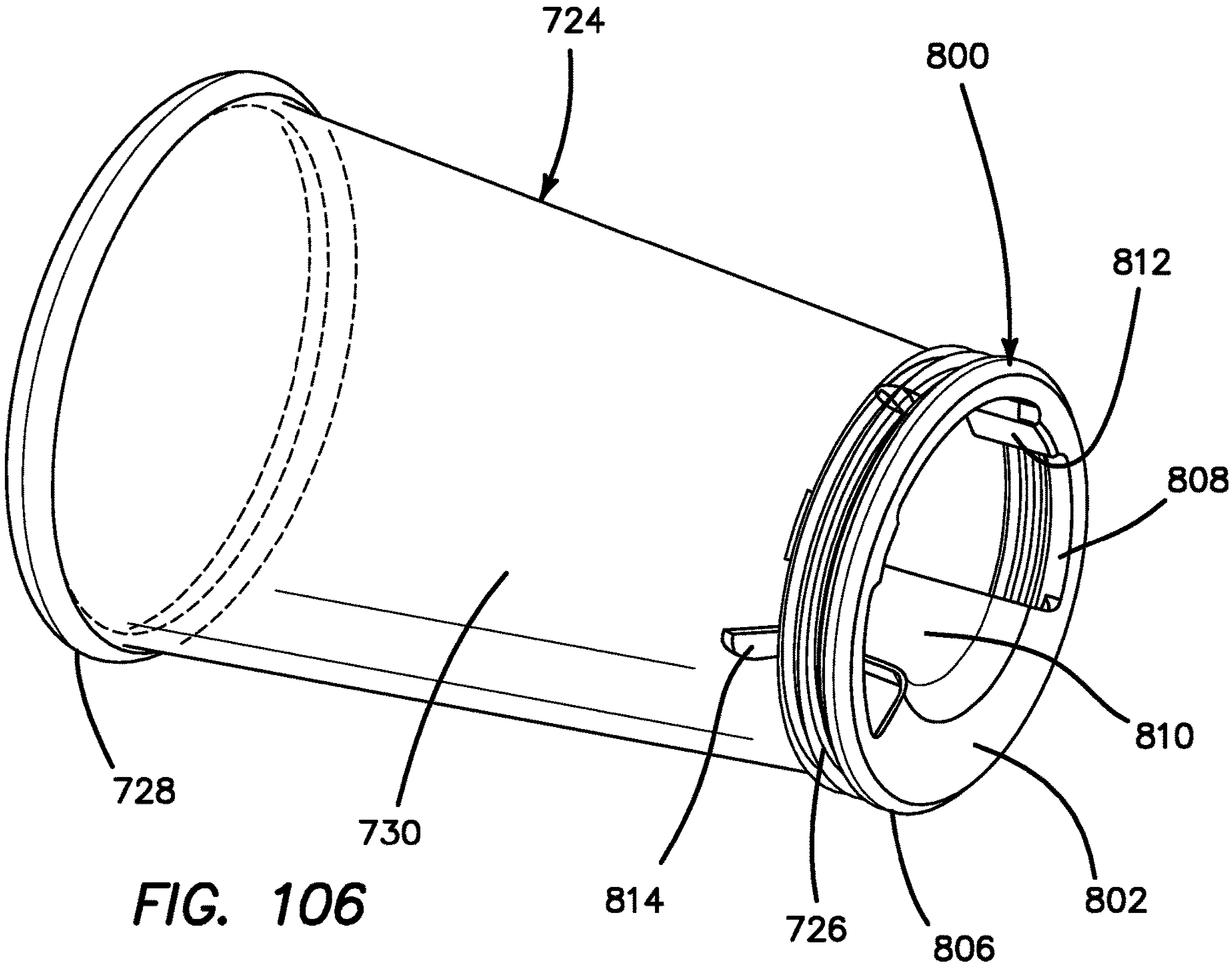


FIG. 106

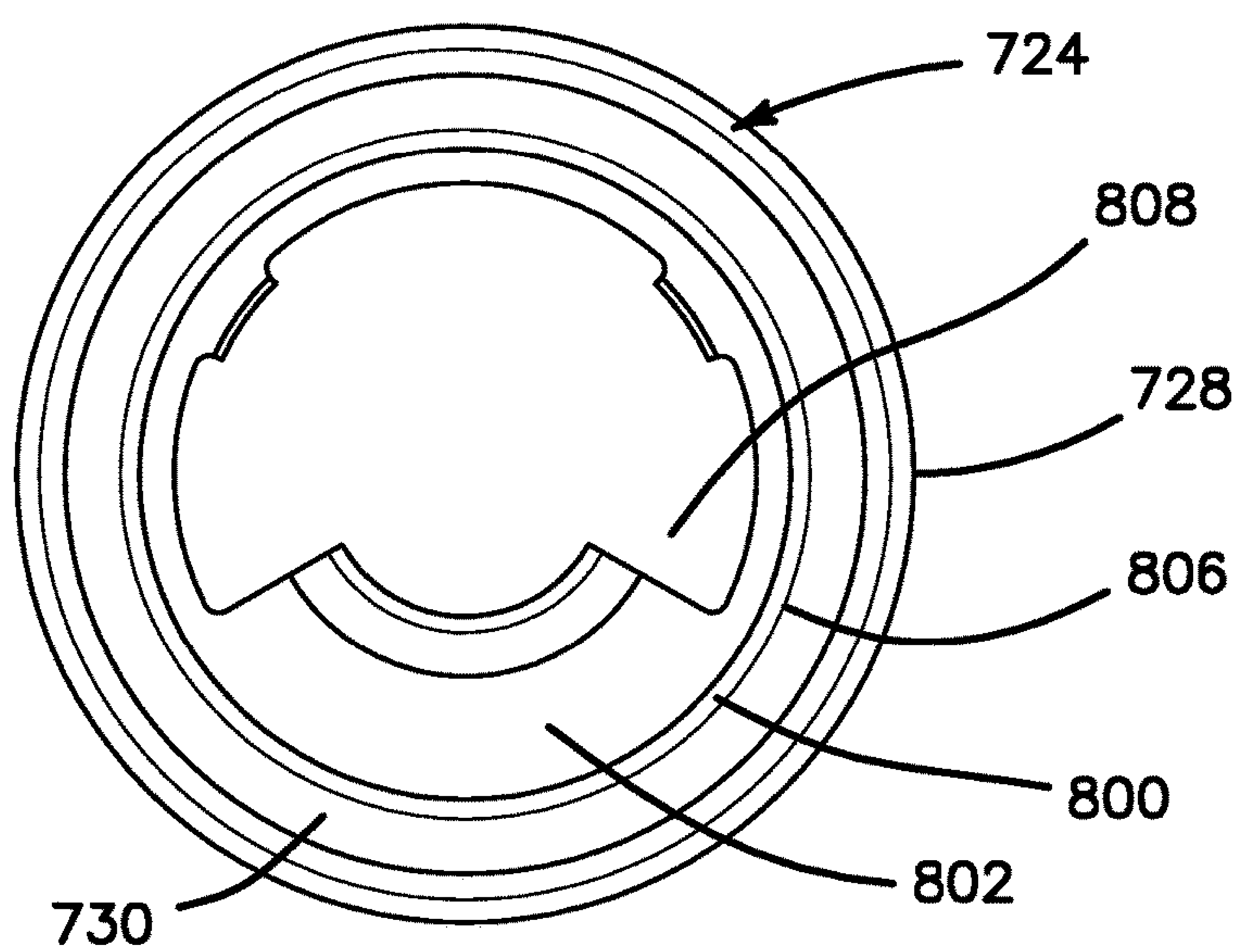


FIG. 107

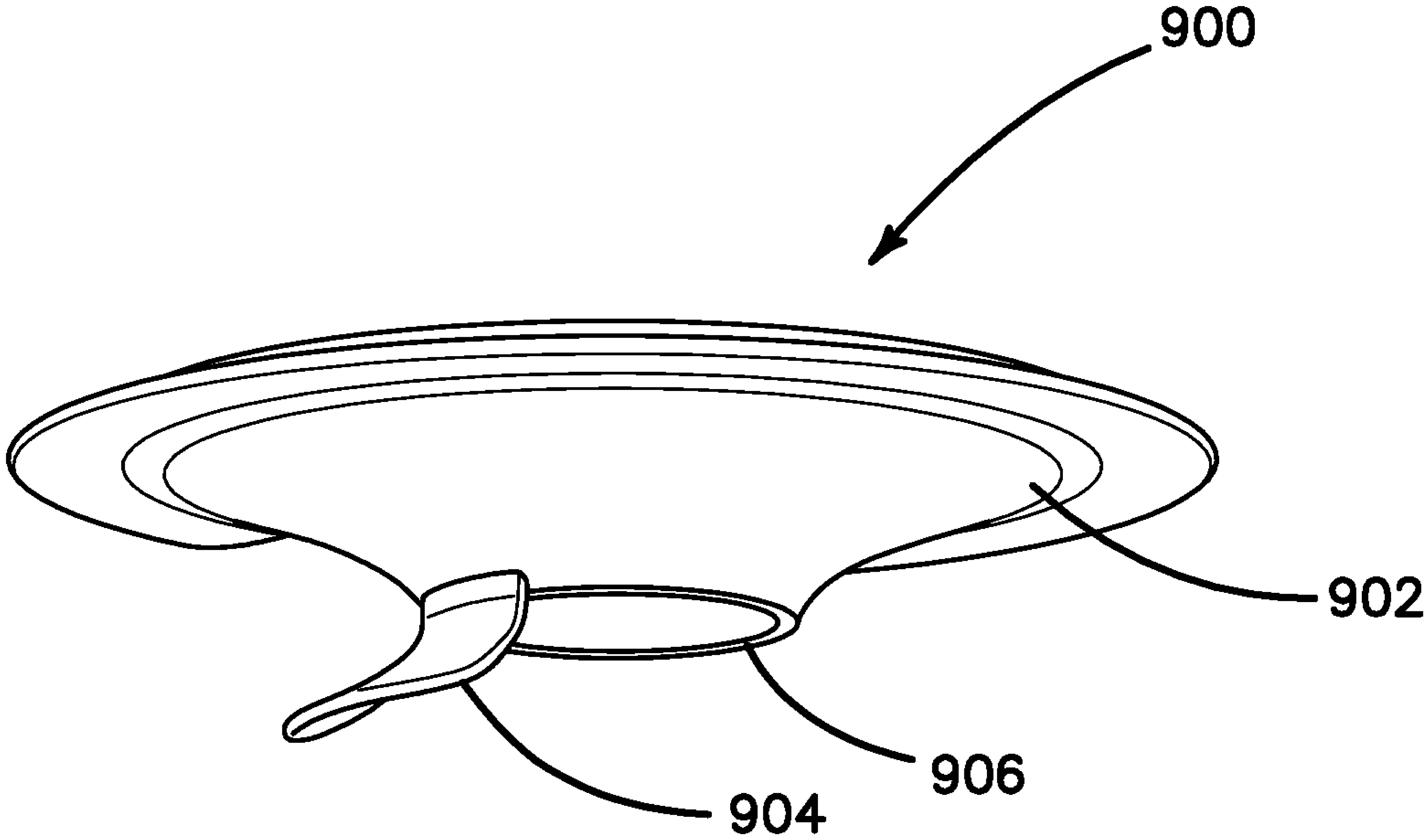


FIG. 108

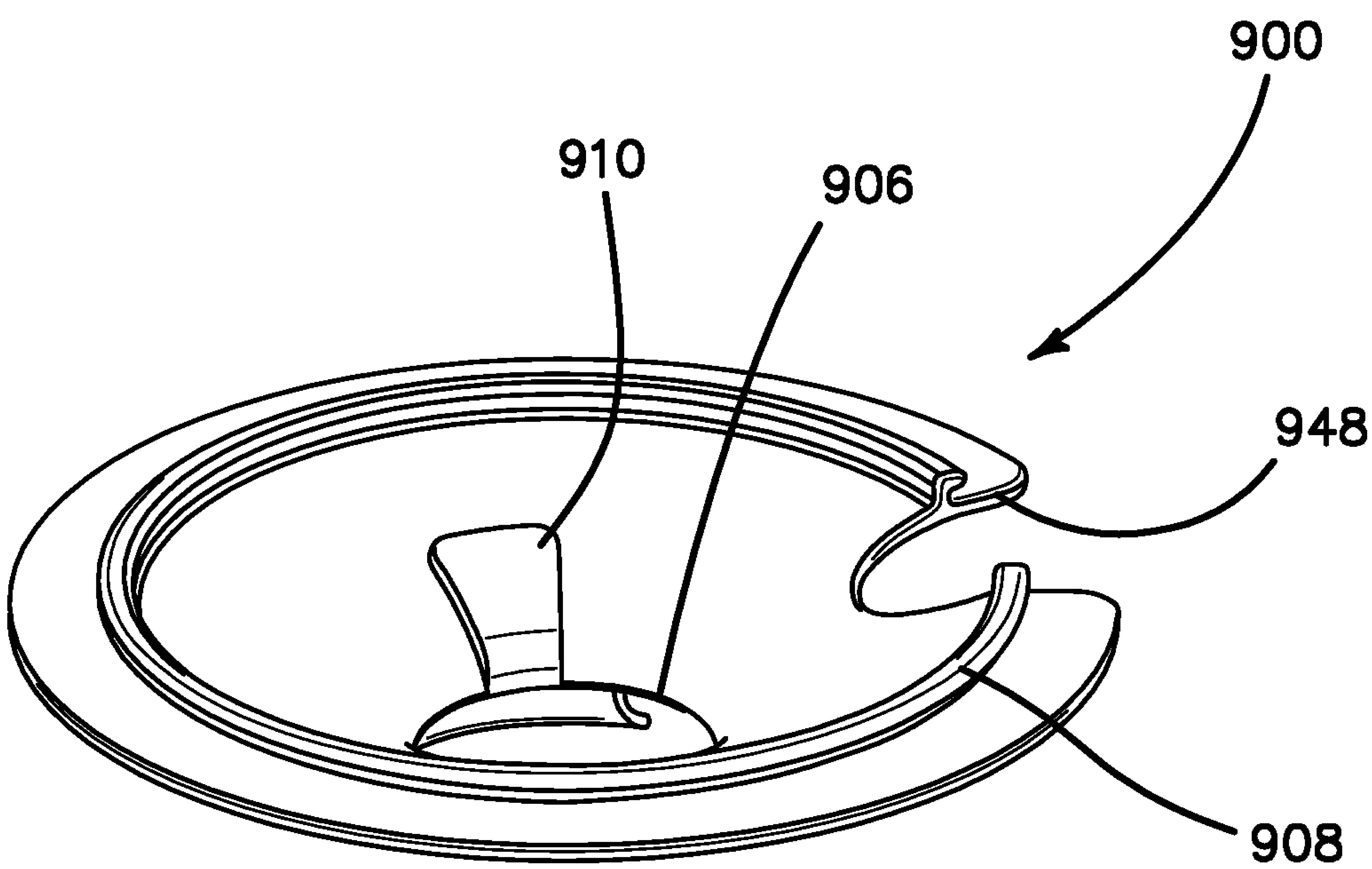


FIG. 109A

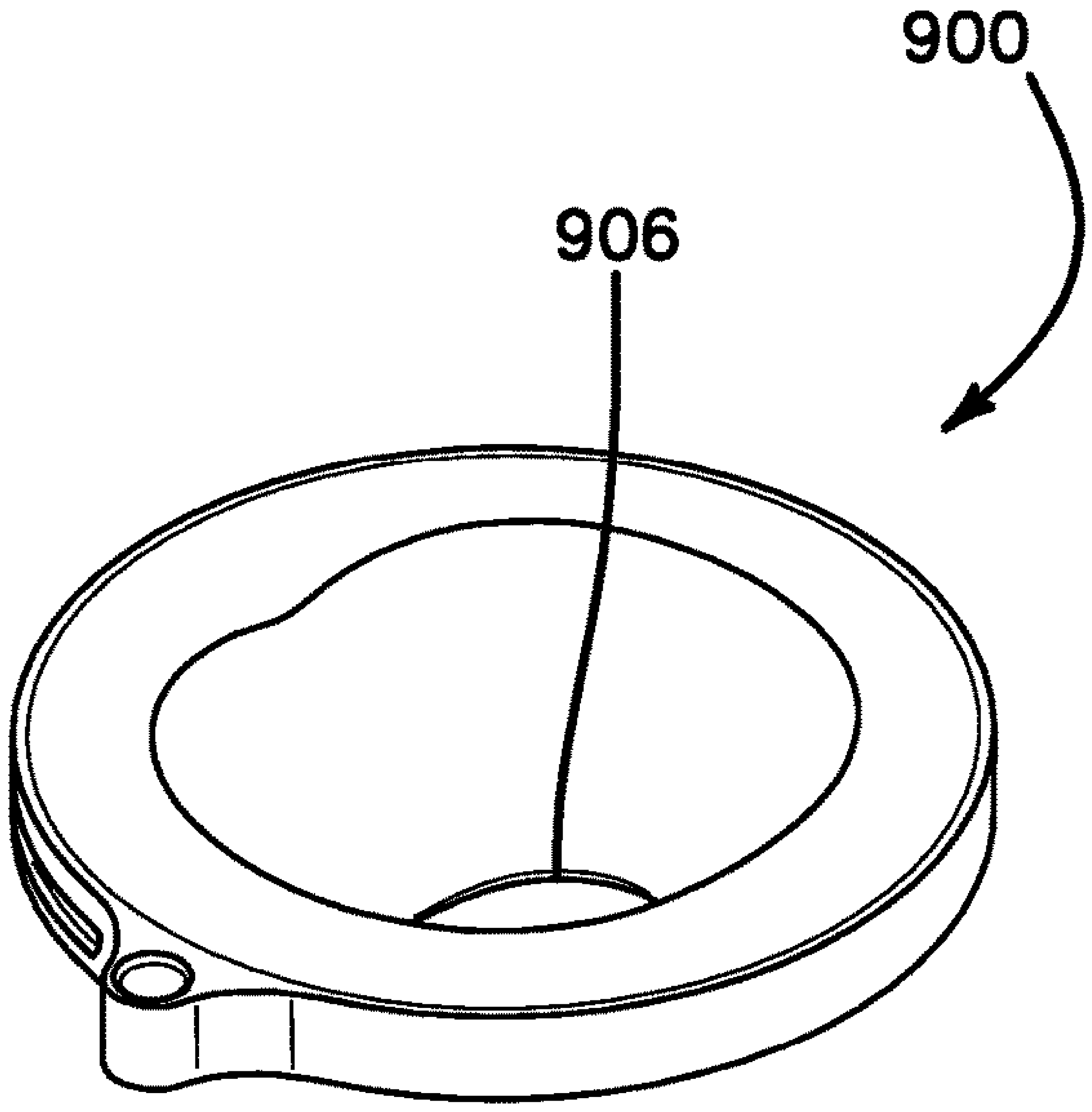


FIG. 109B

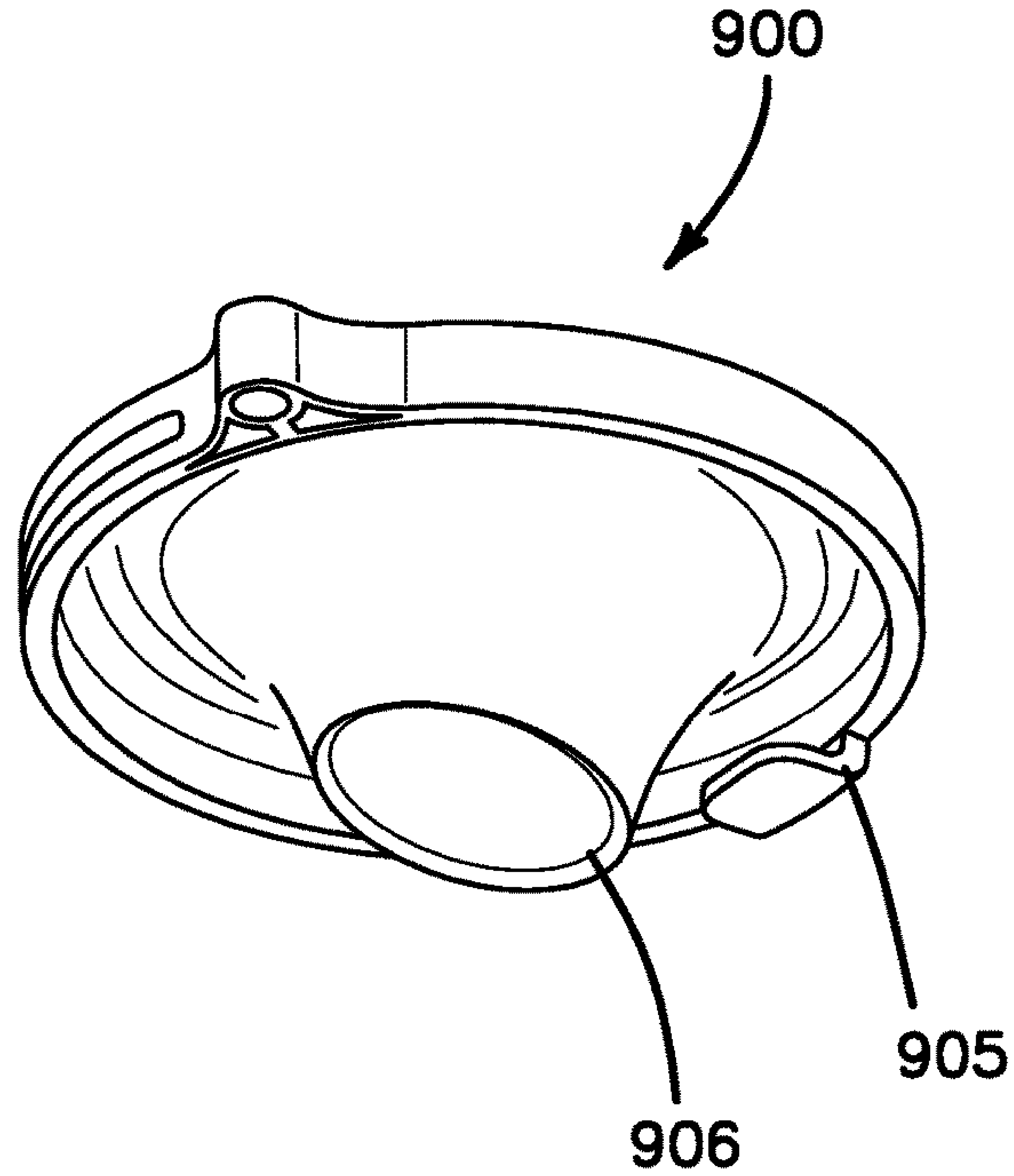


FIG. 109C

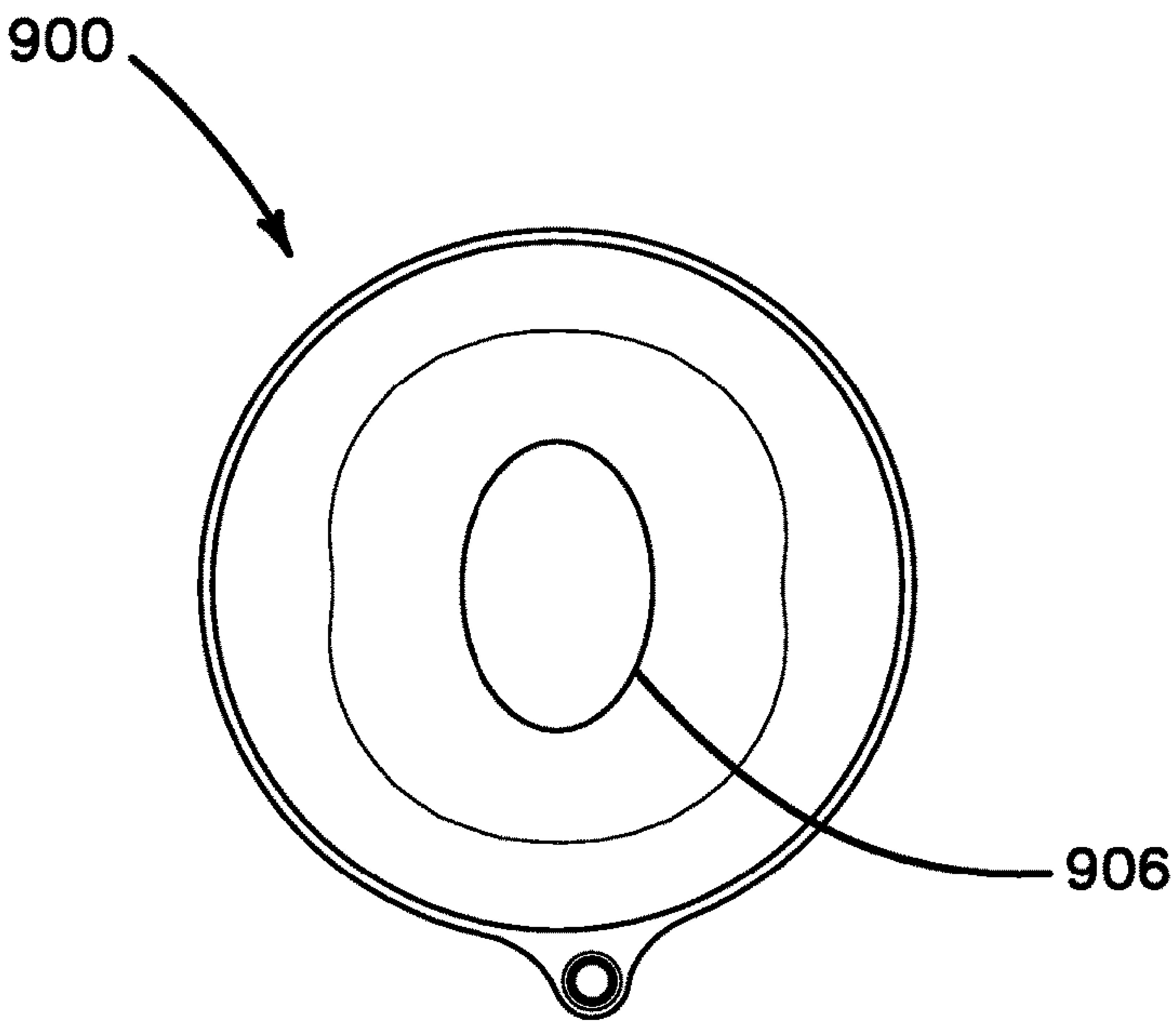


FIG. 109D

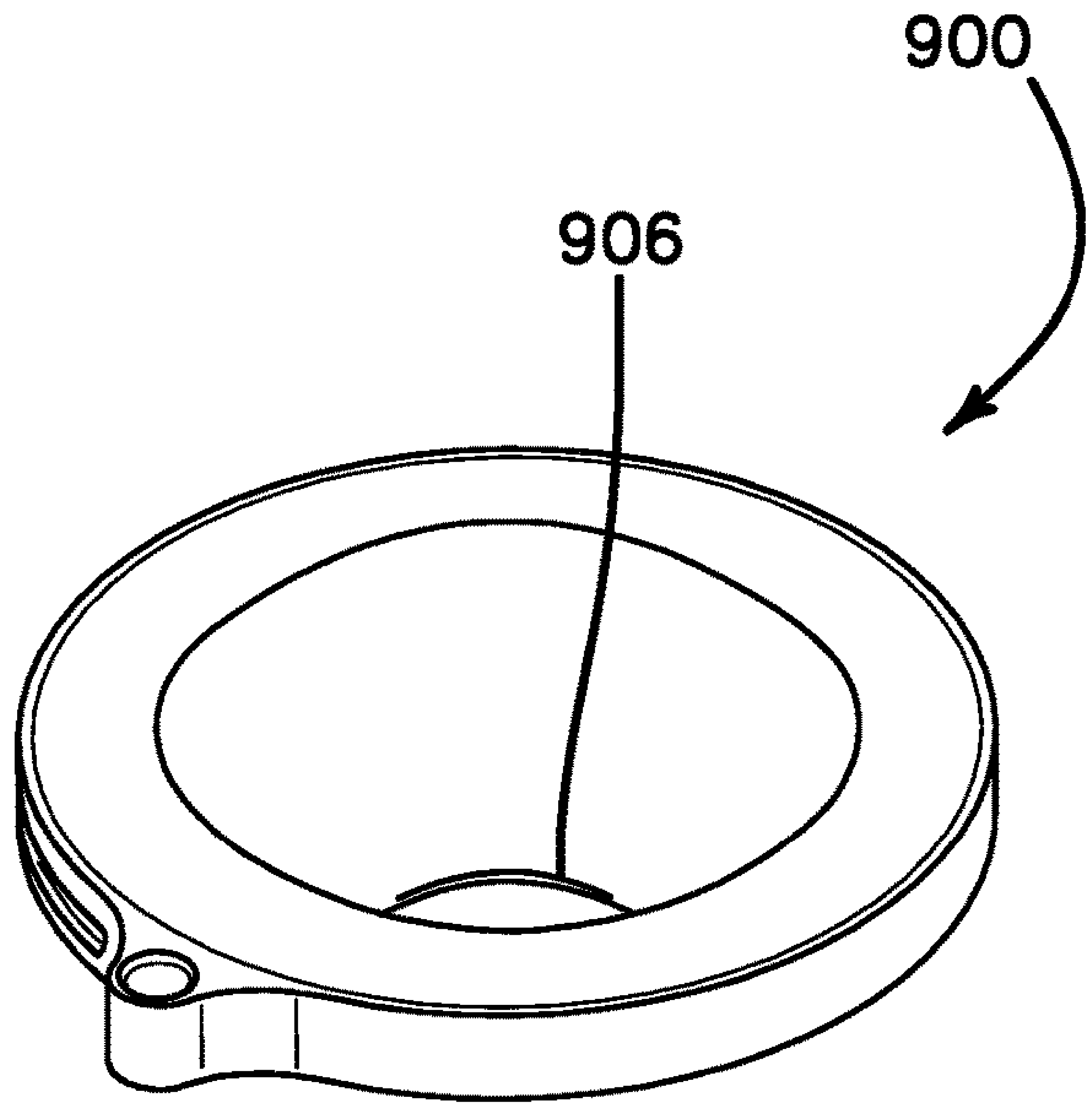


FIG. 109E

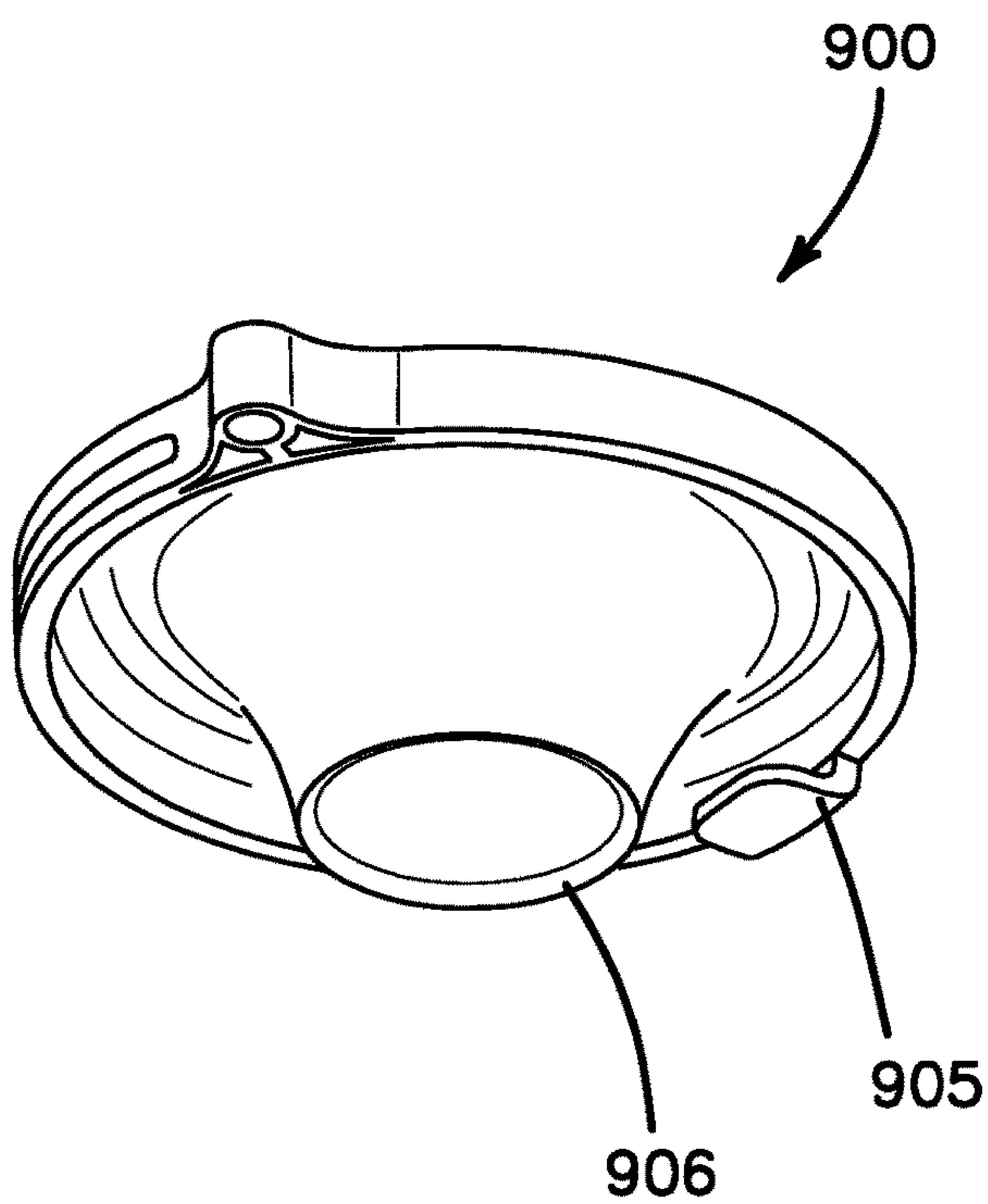


FIG. 109F

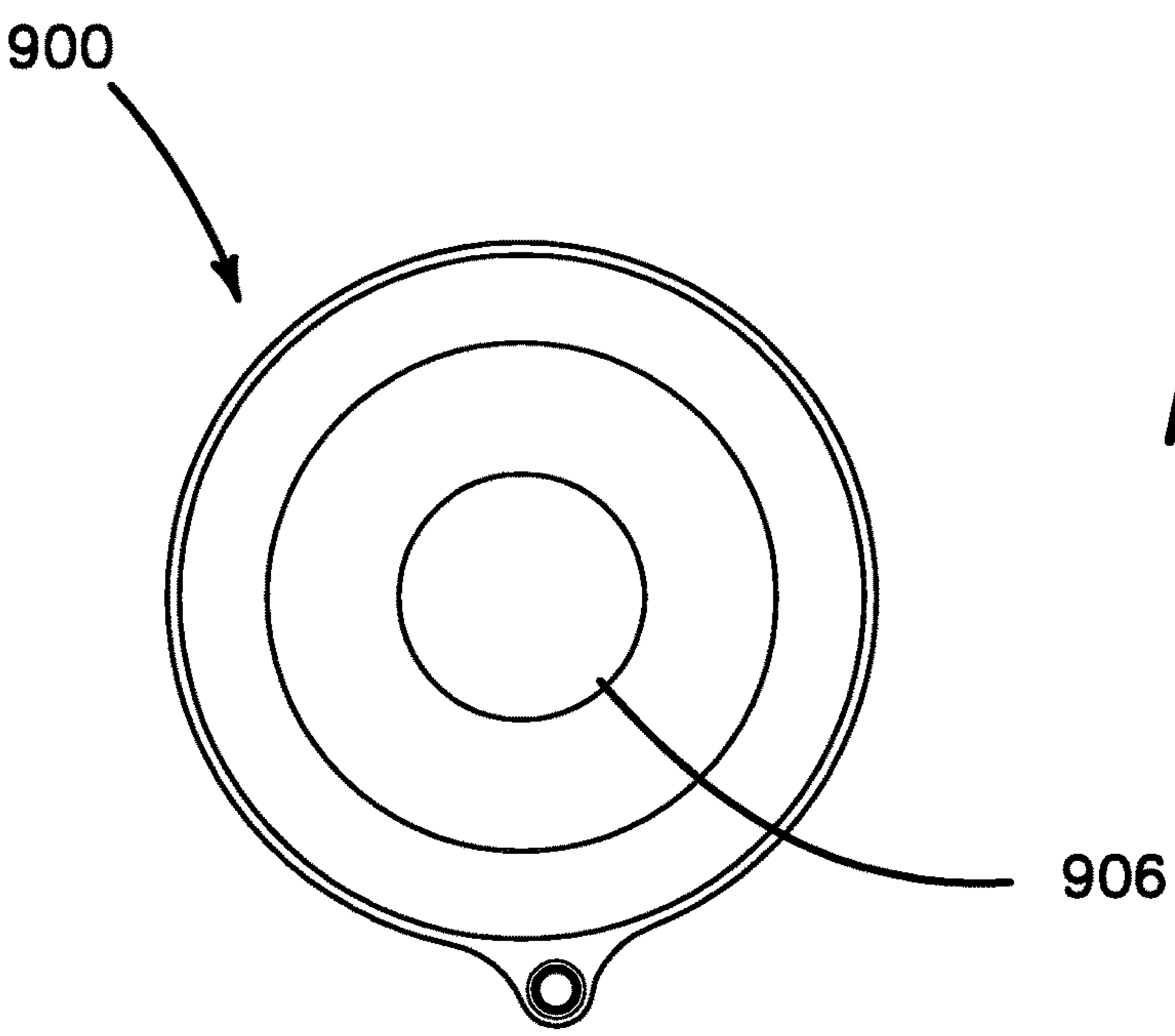


FIG. 109G

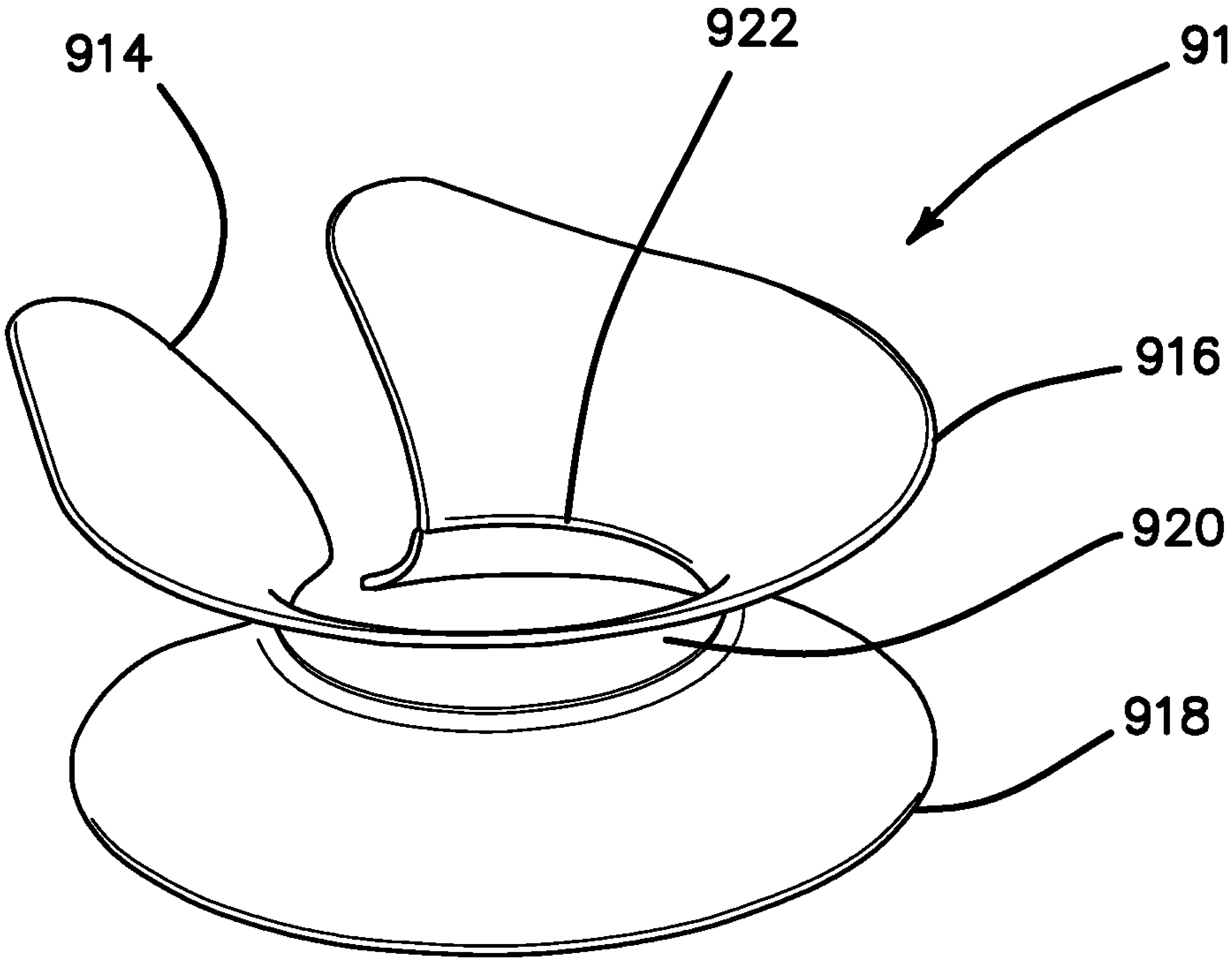


FIG. 110

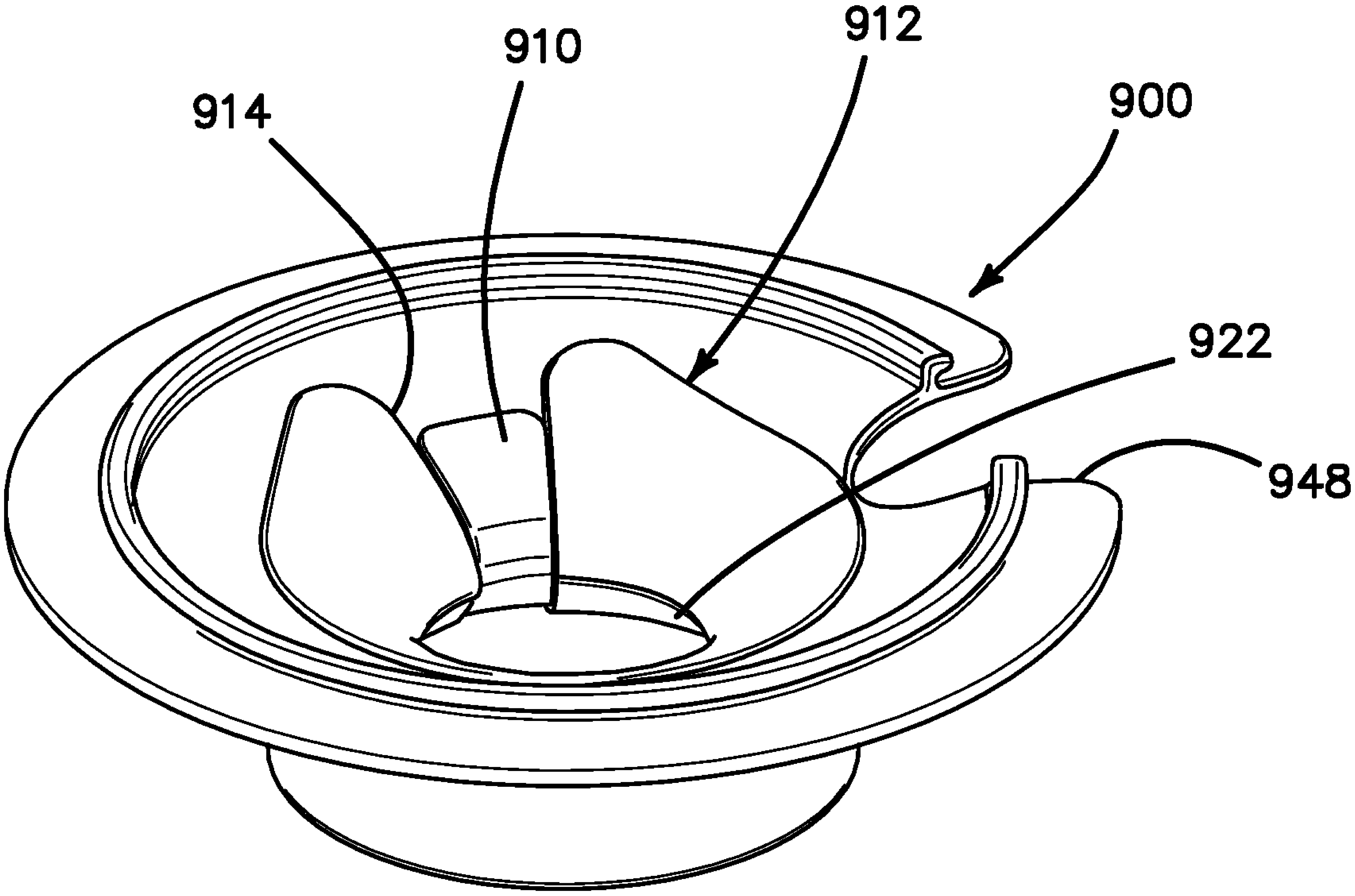


FIG. 111

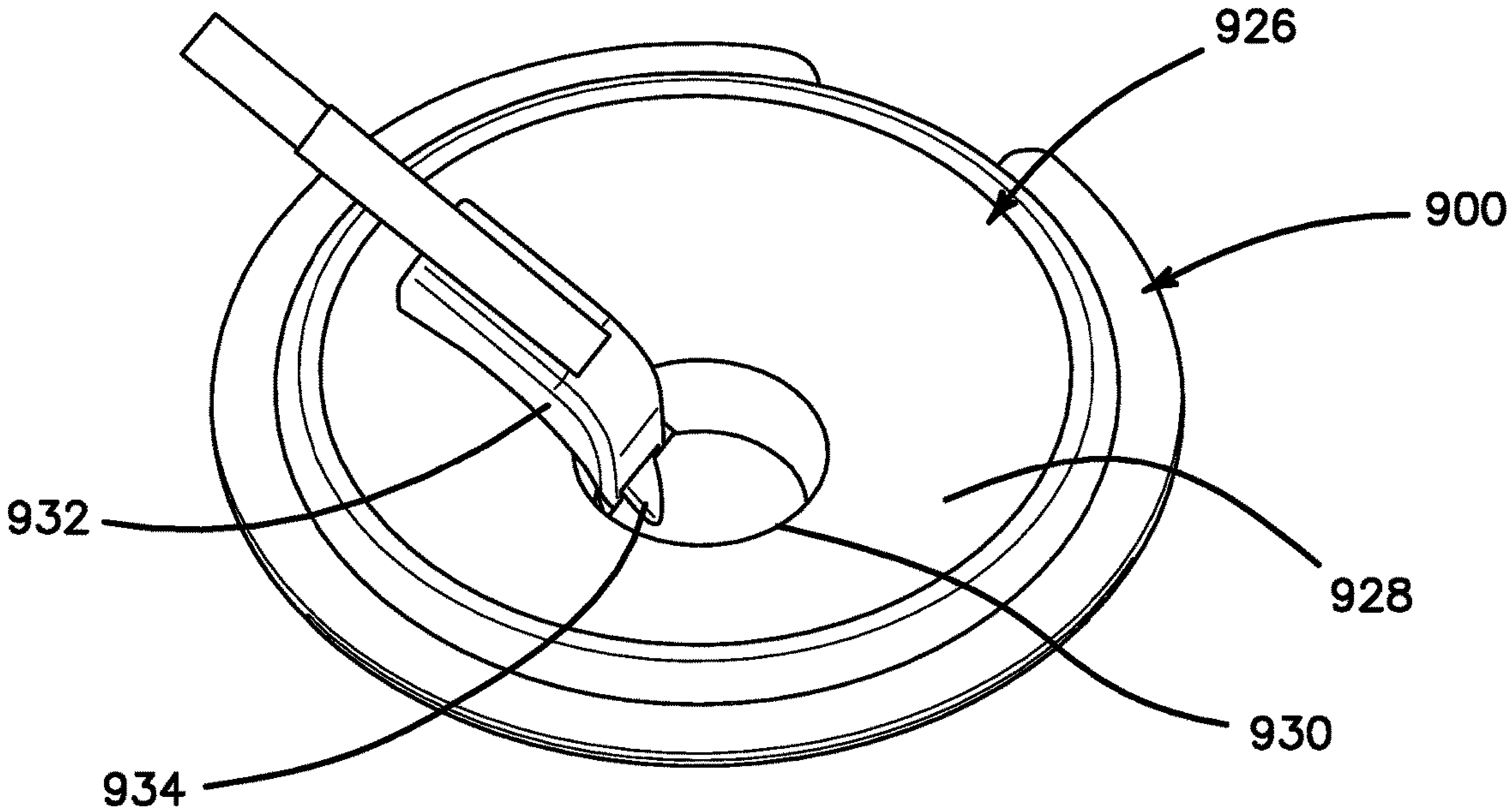


FIG. 112

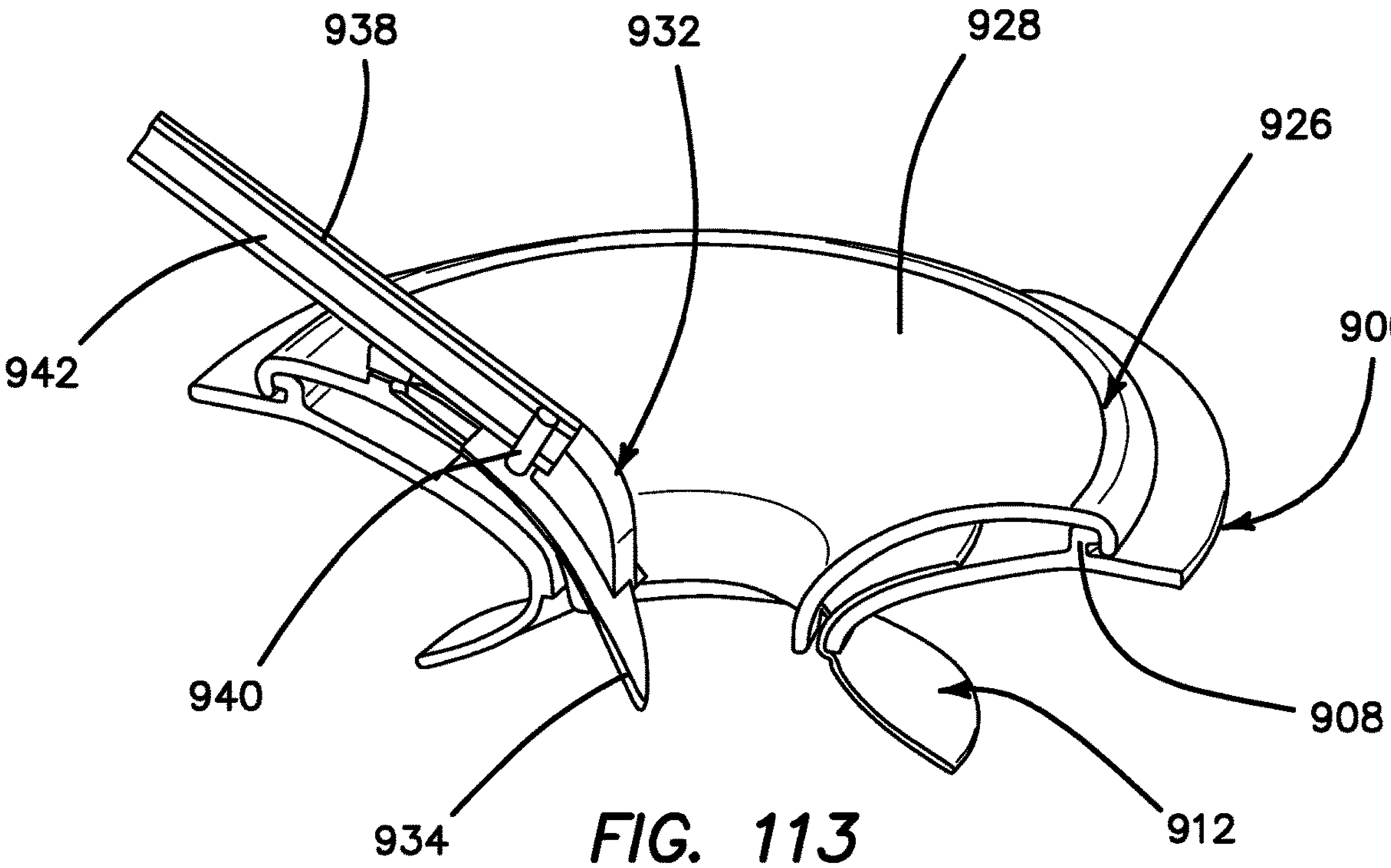


FIG. 113

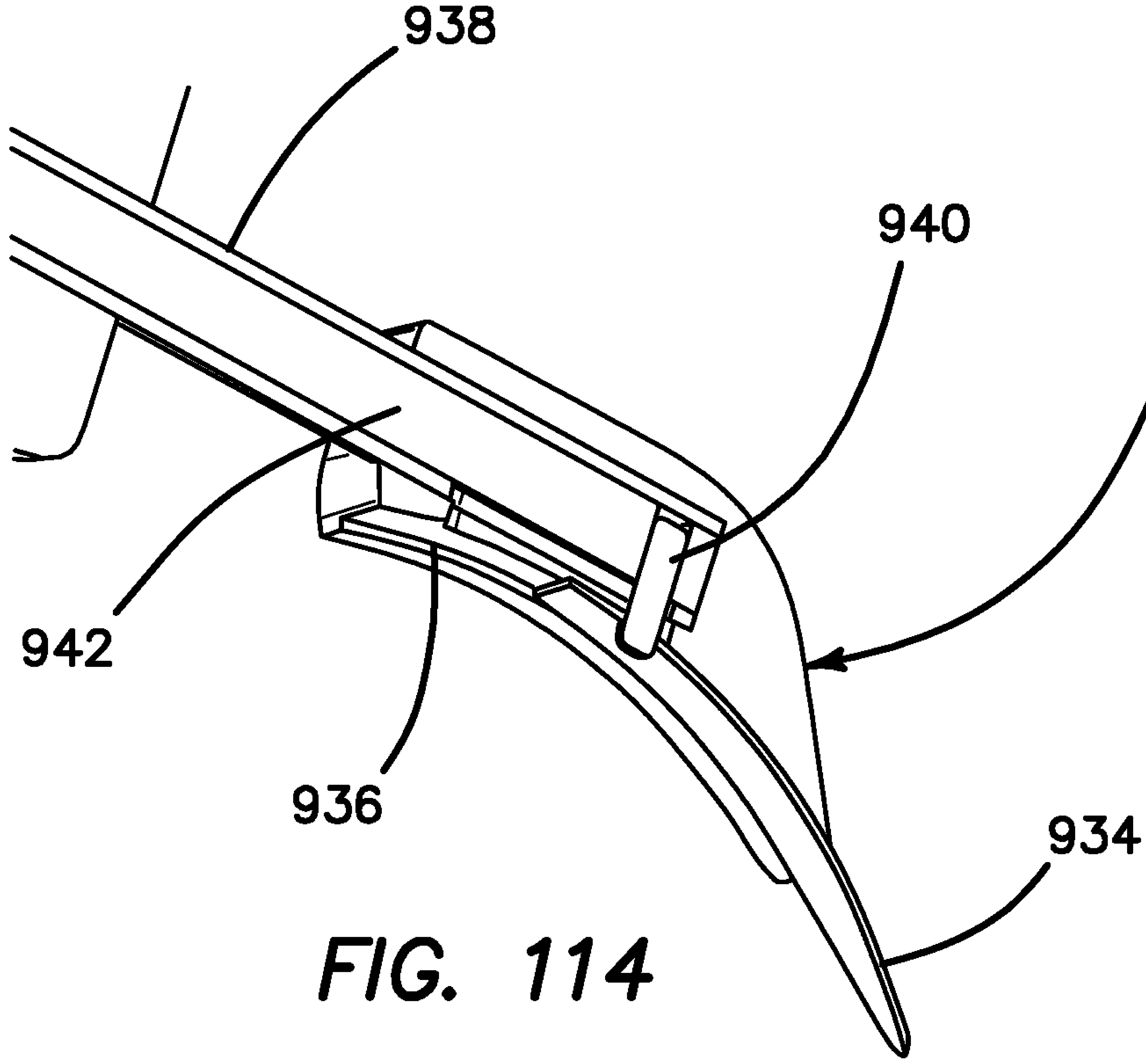
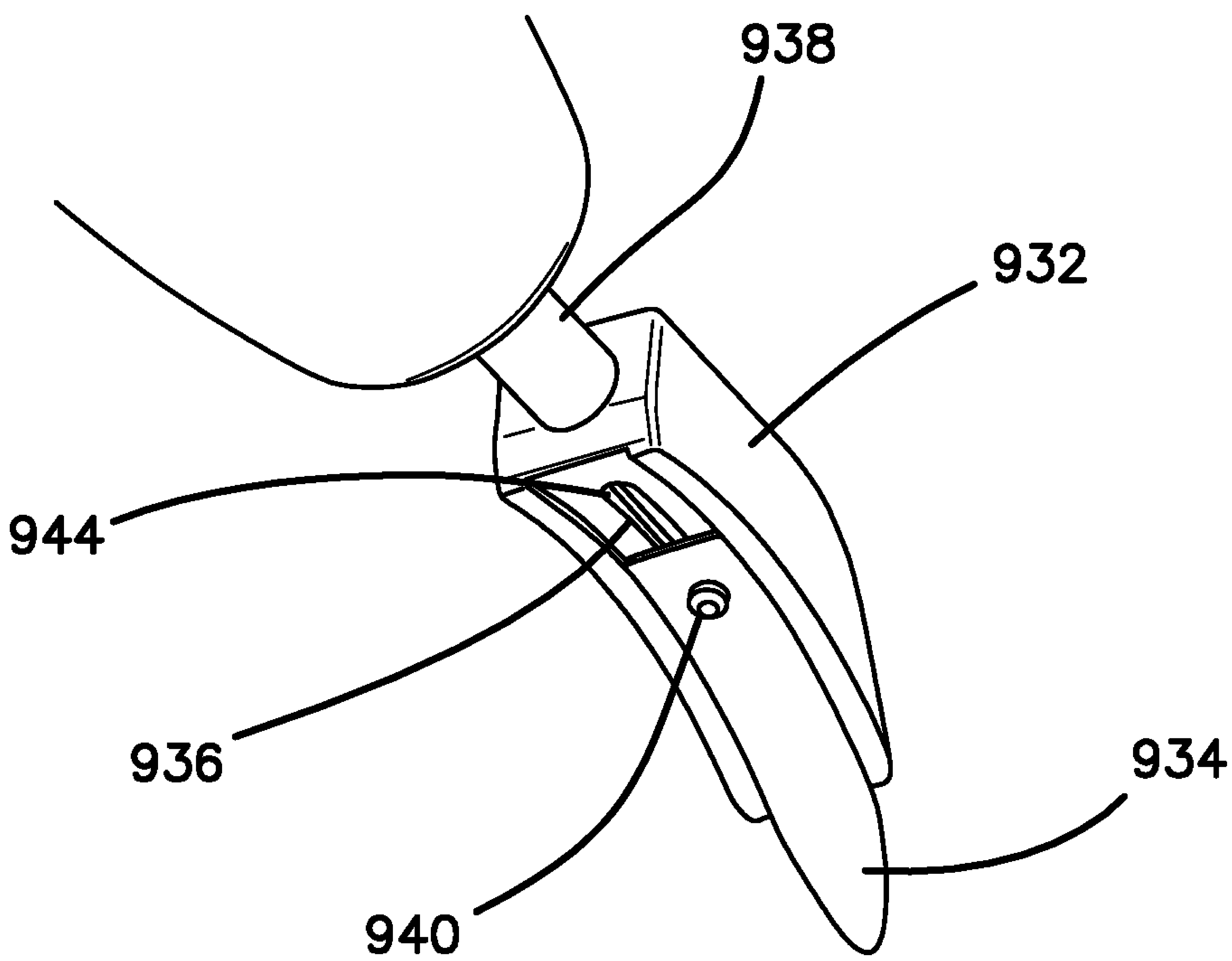


FIG. 114

FIG. 115



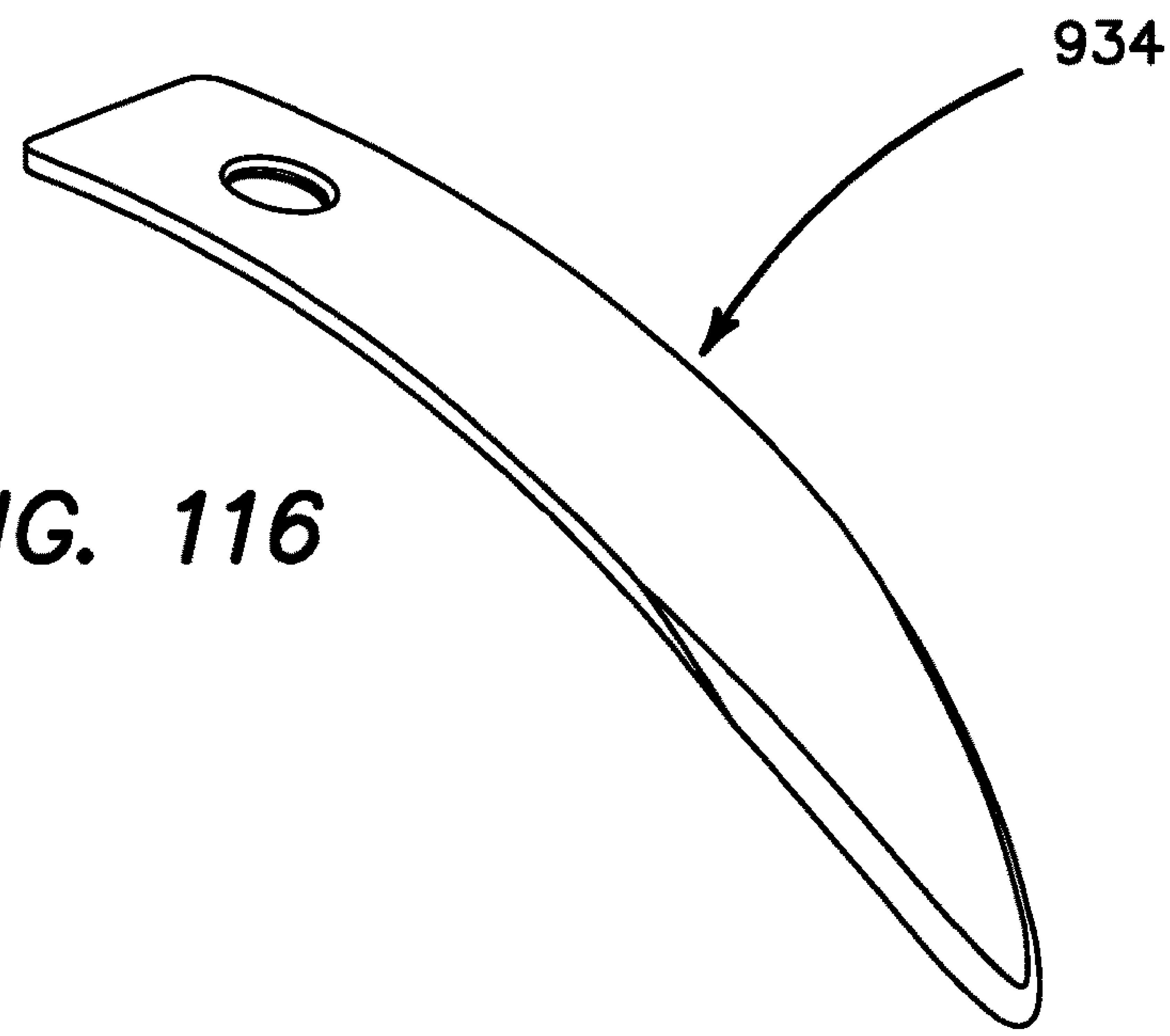


FIG. 116

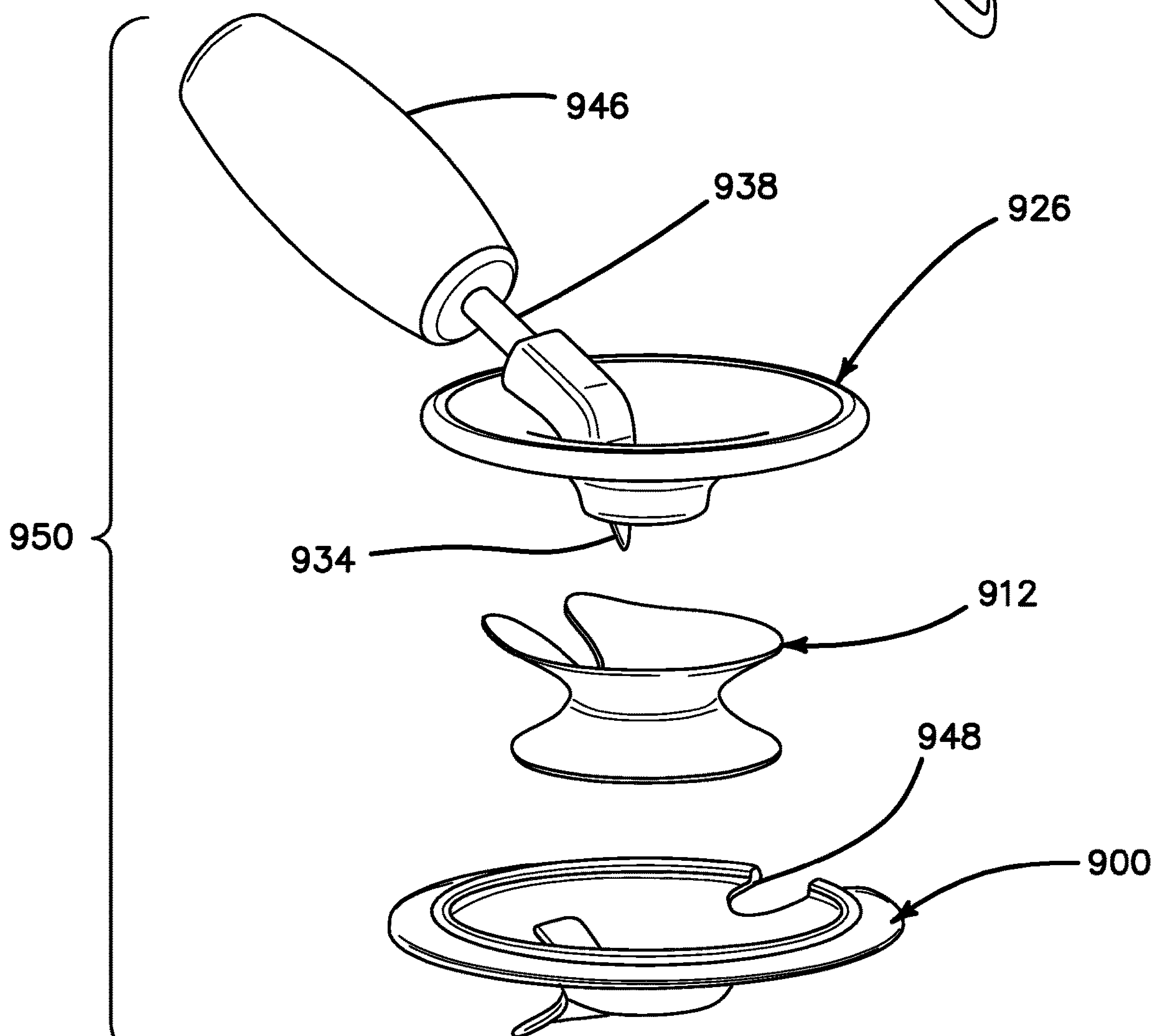


FIG. 117

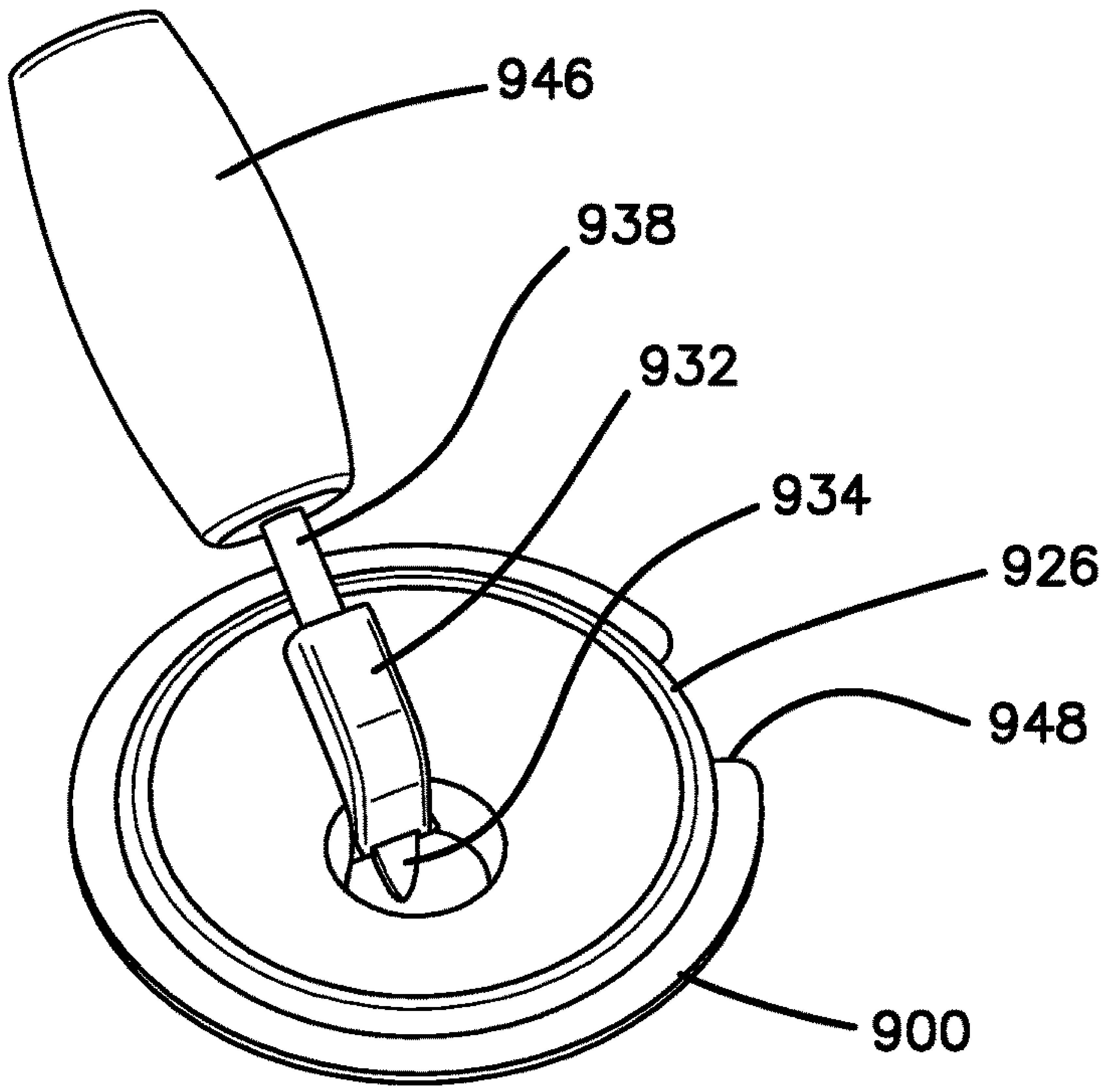


FIG. 118

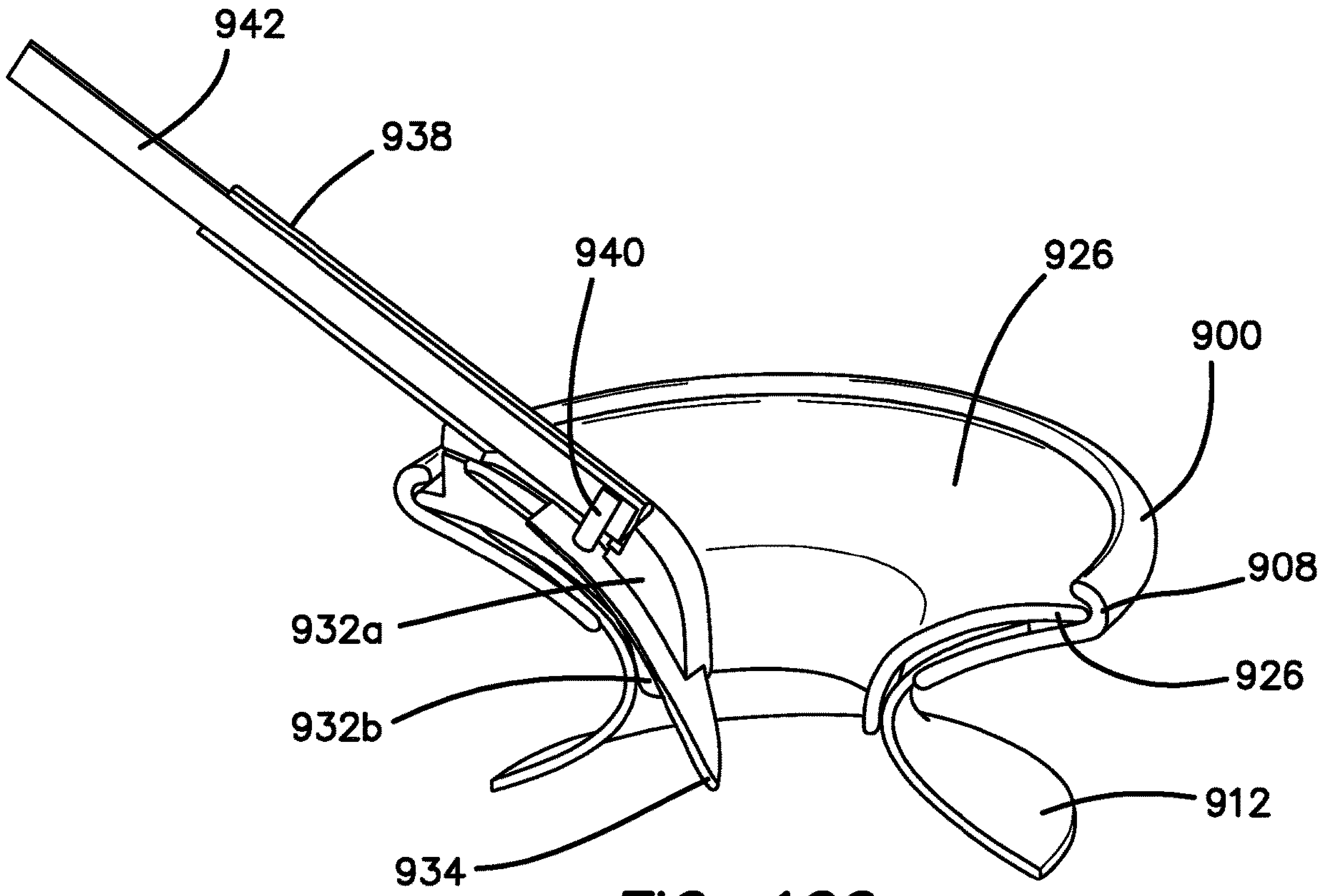


FIG. 122

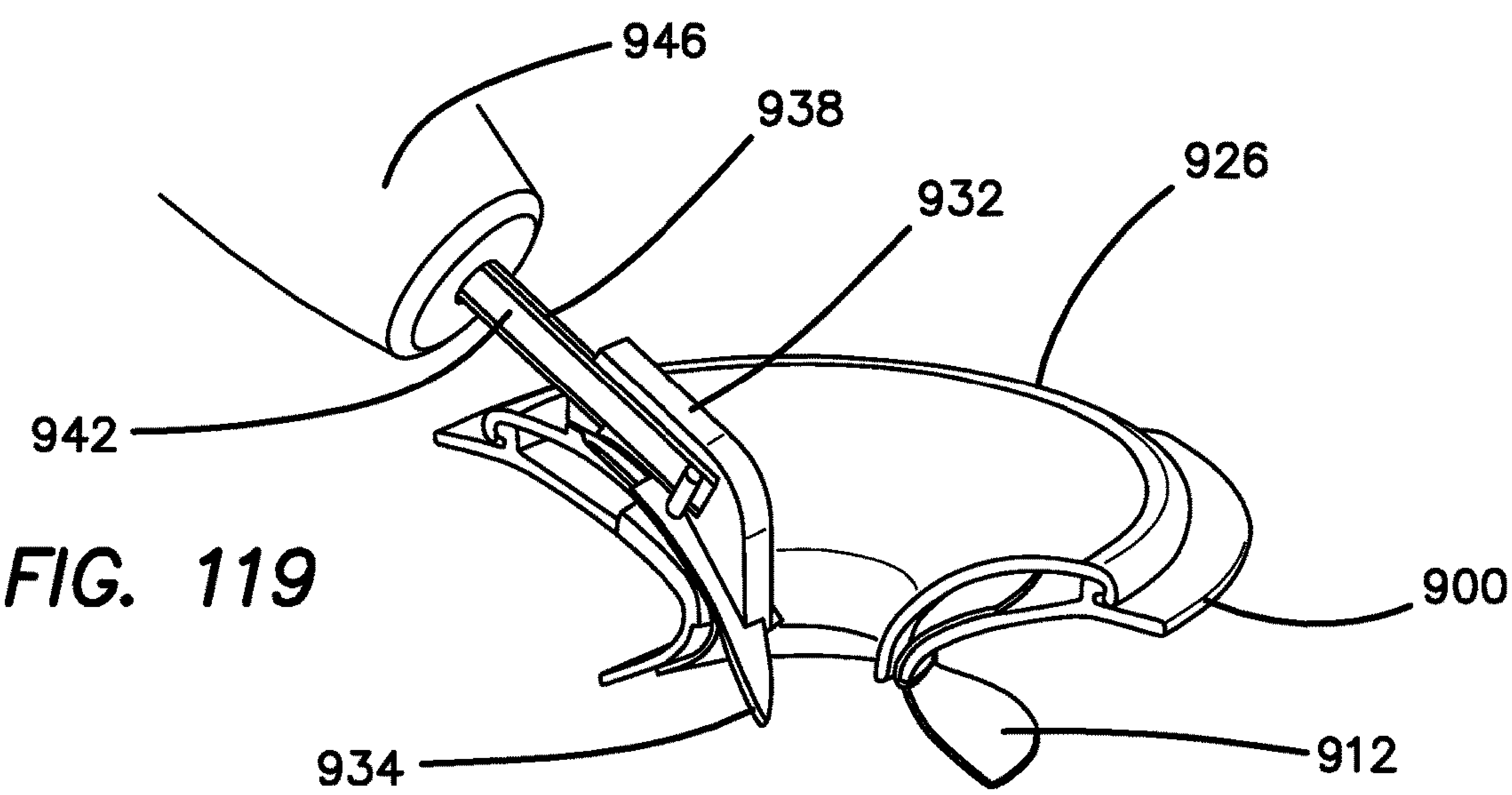


FIG. 119

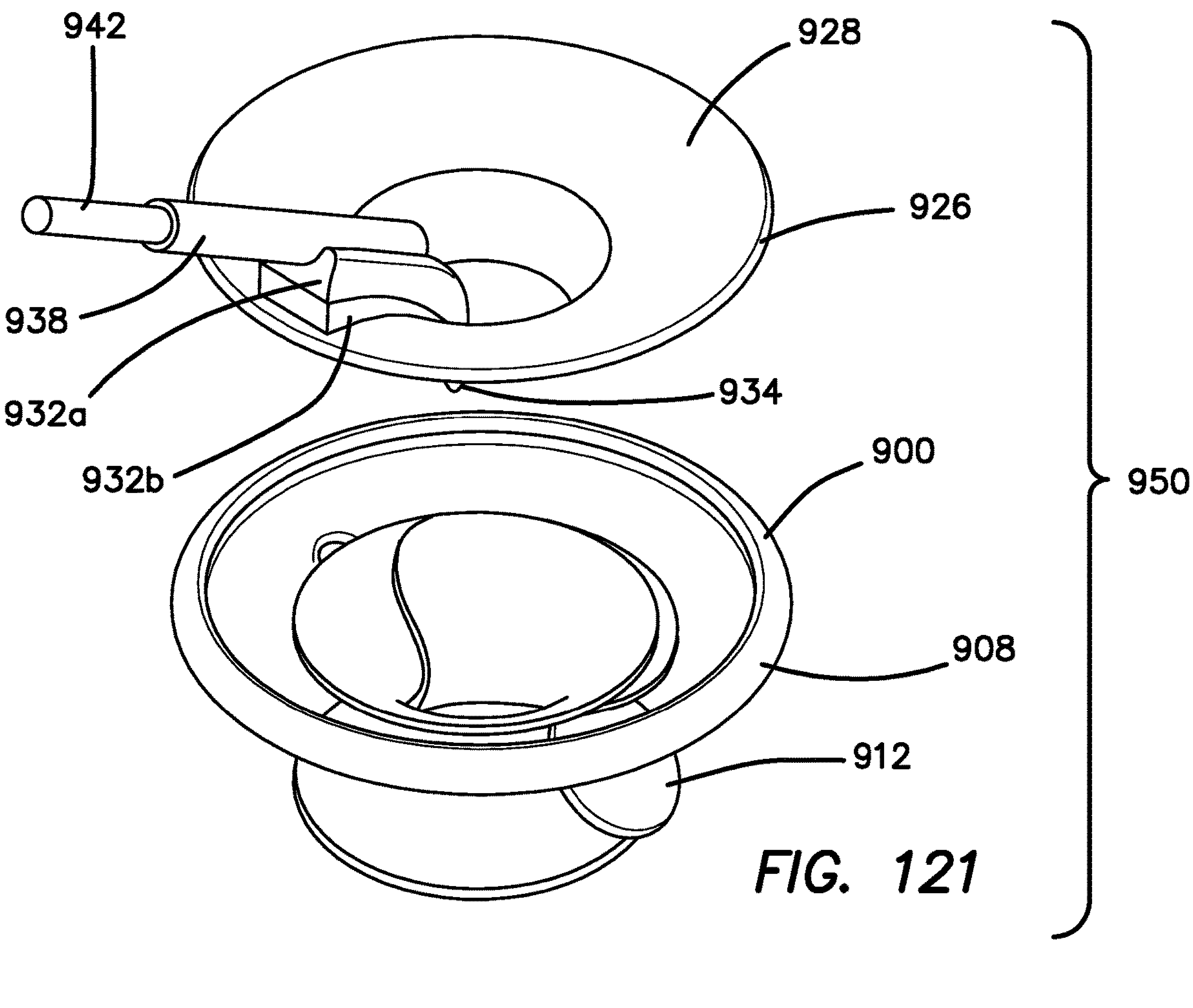


FIG. 121

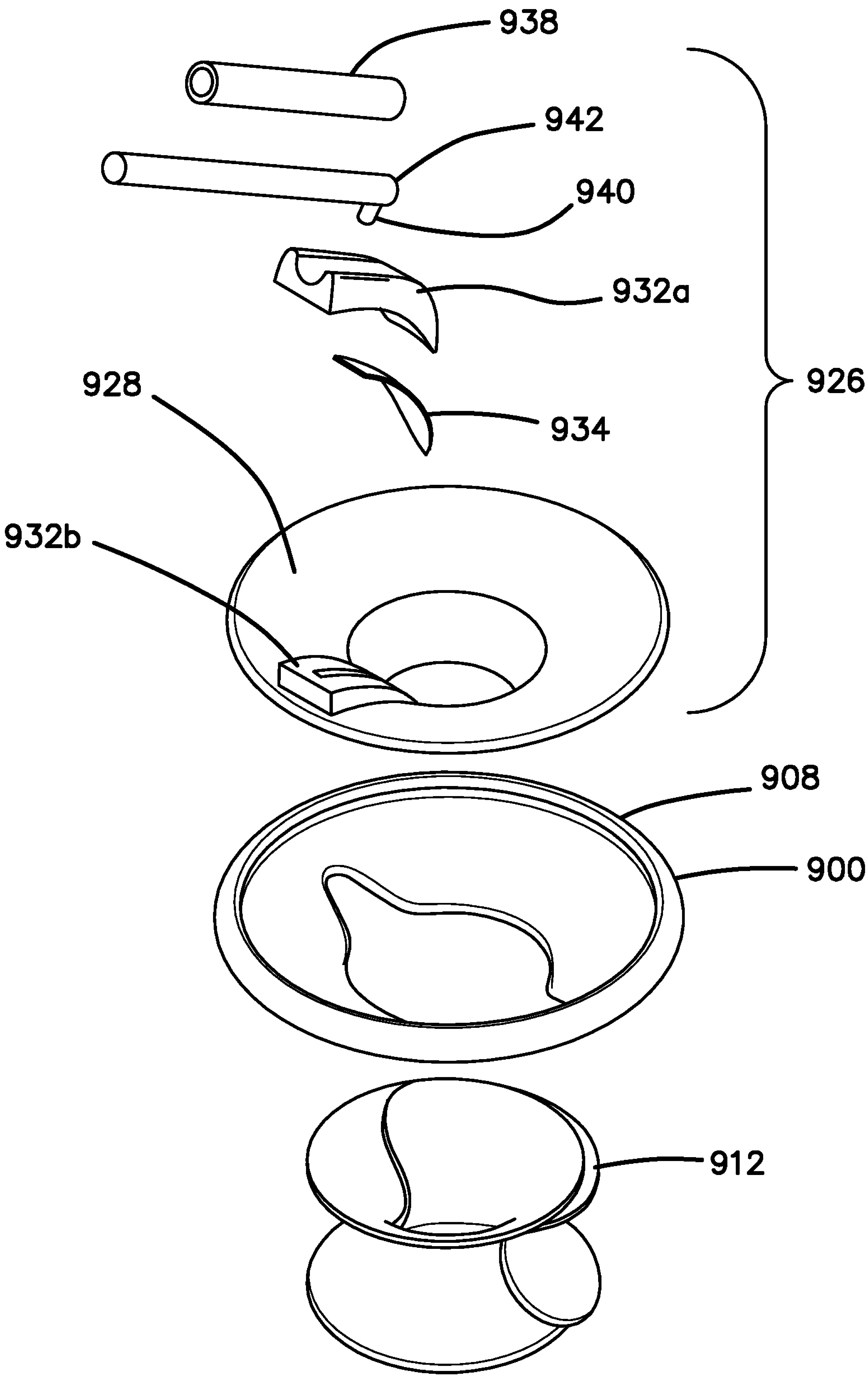


FIG. 120

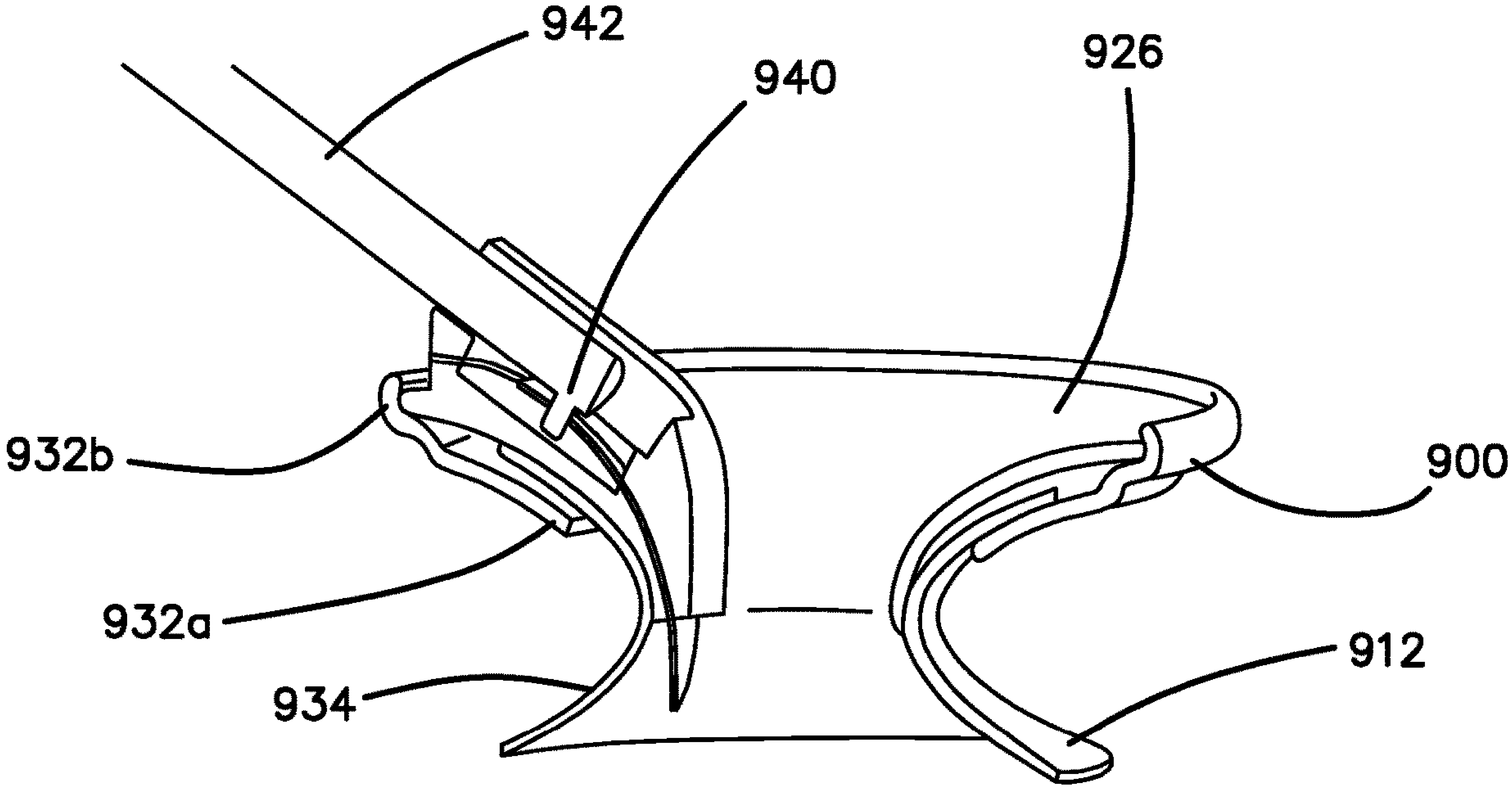


FIG. 123

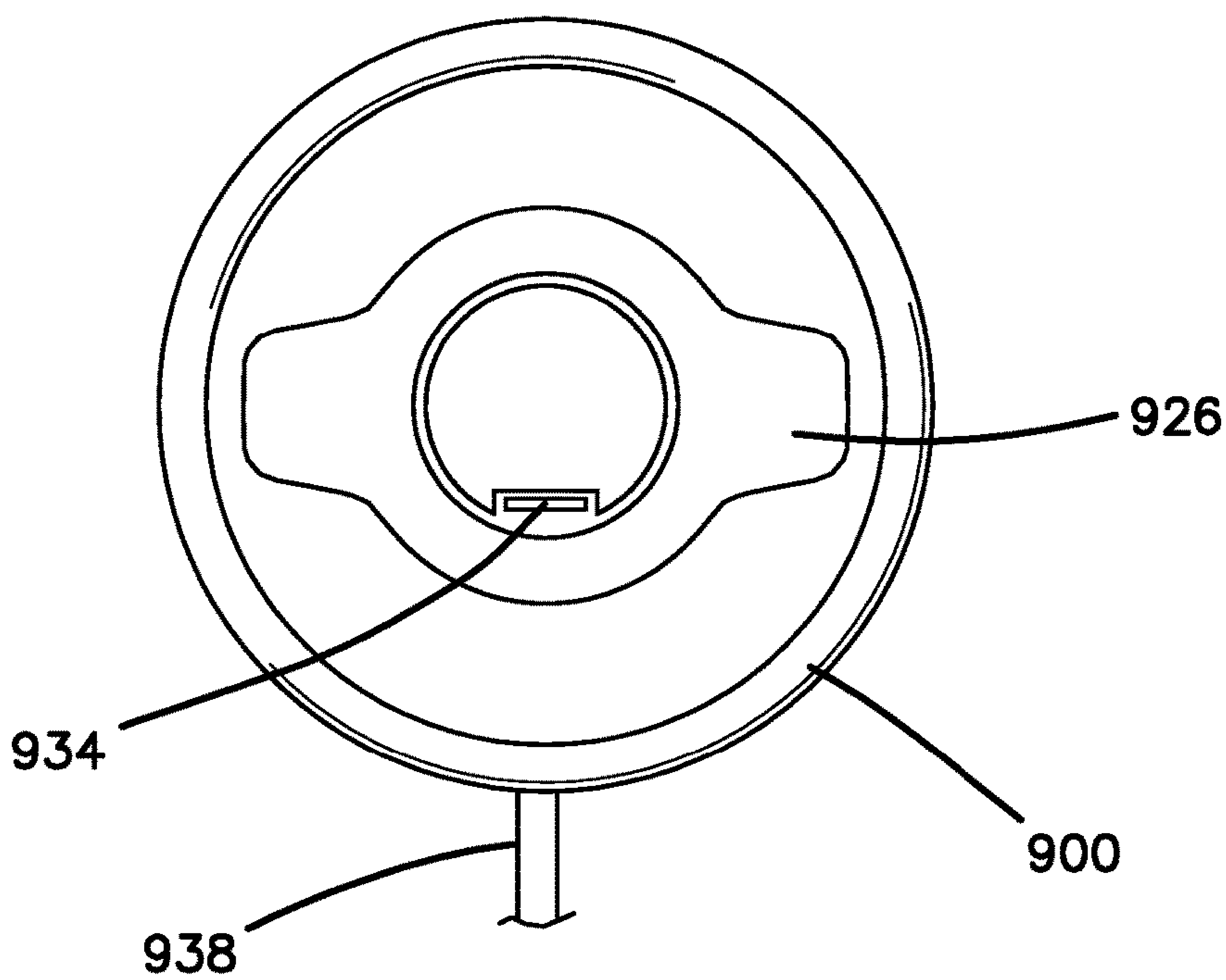


FIG. 124

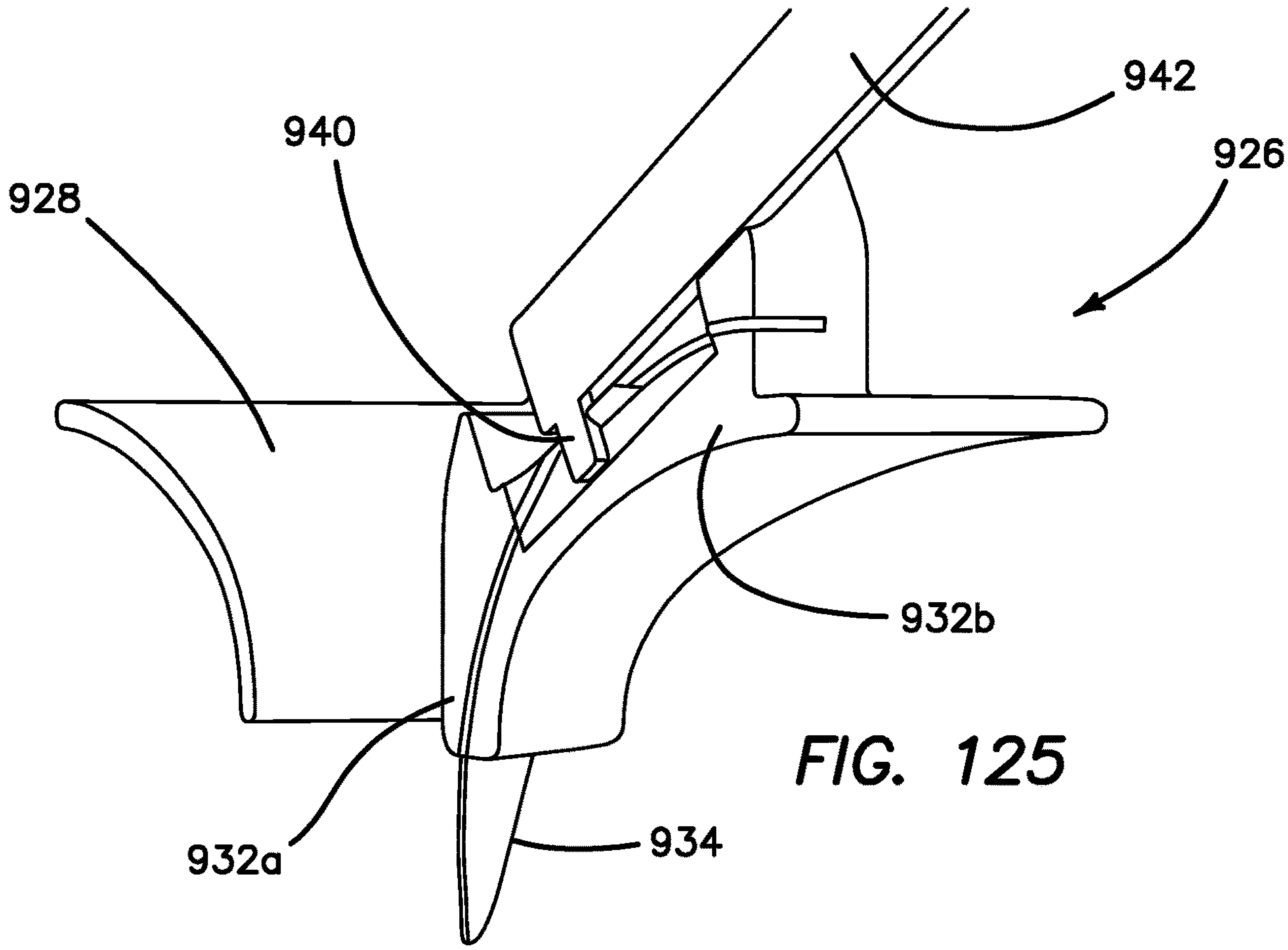


FIG. 125

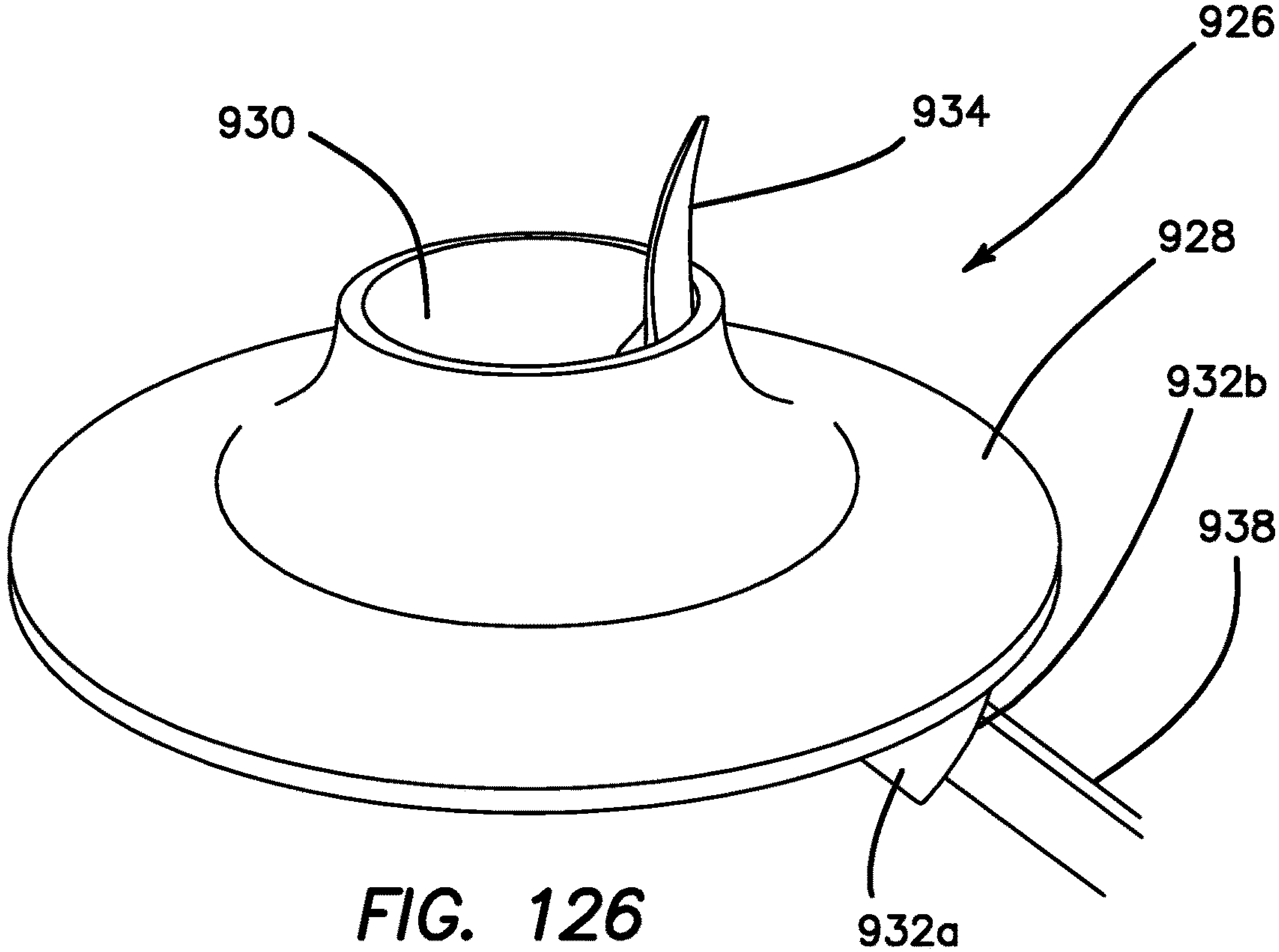


FIG. 126

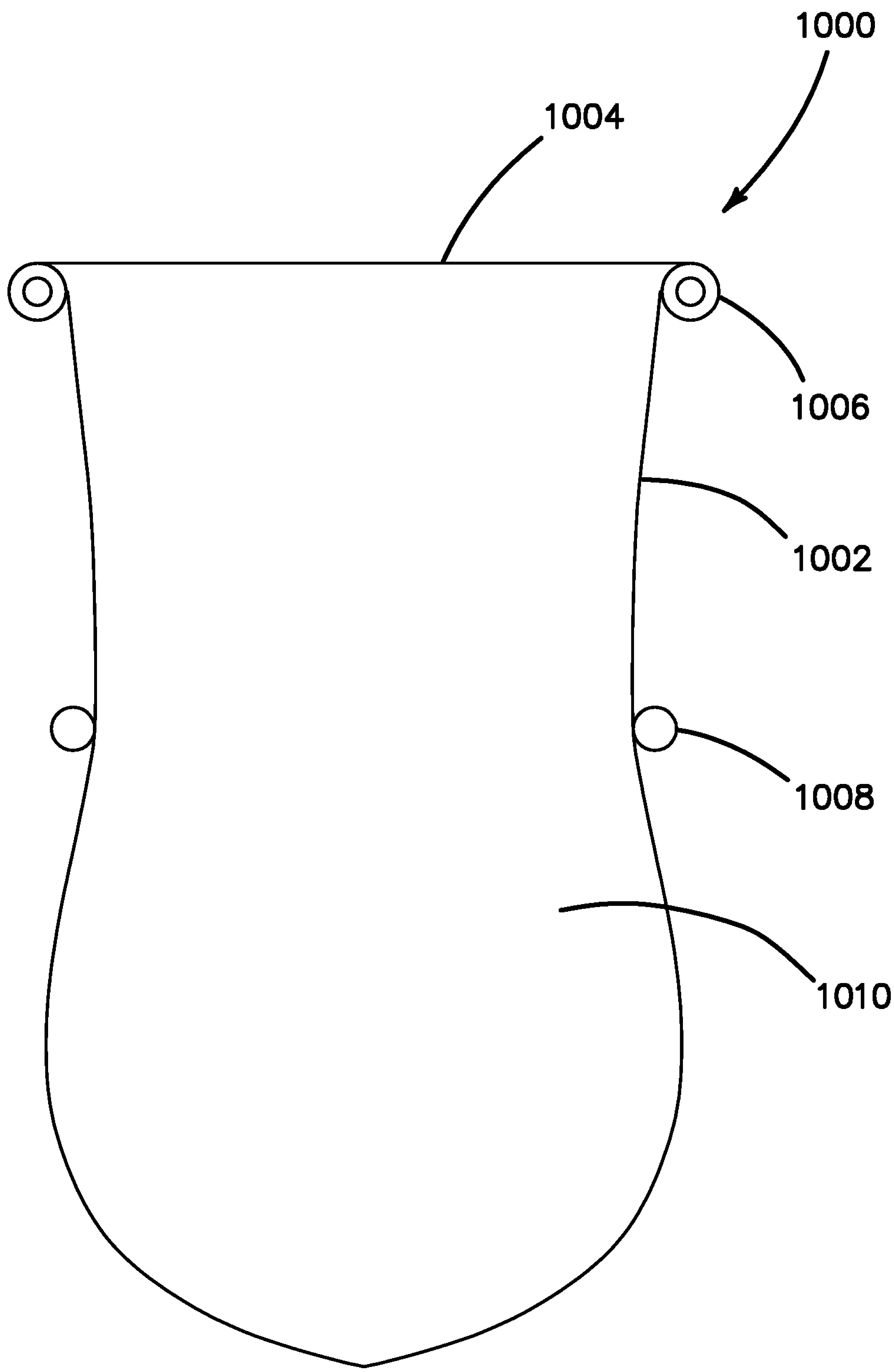


FIG. 127

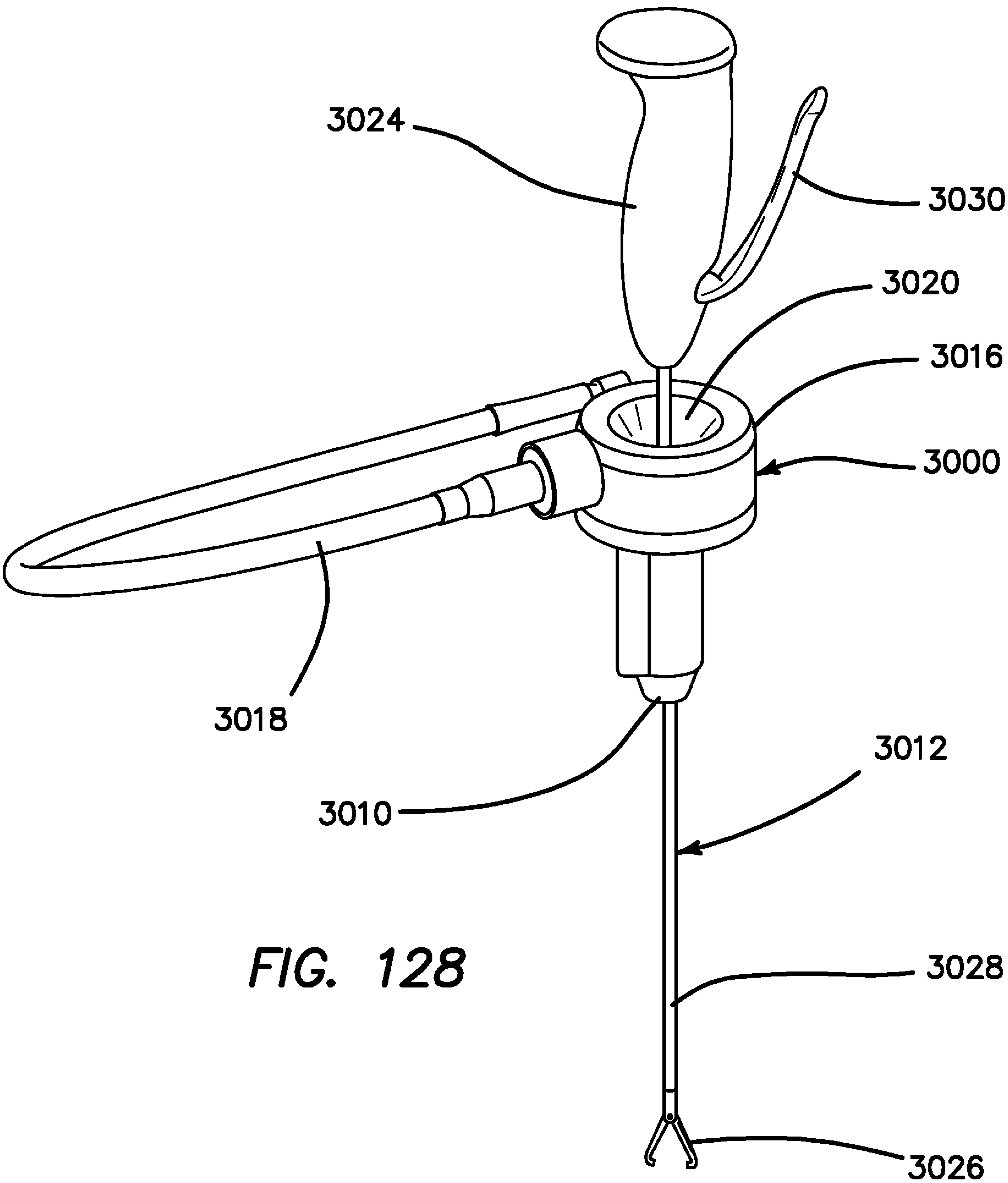


FIG. 128

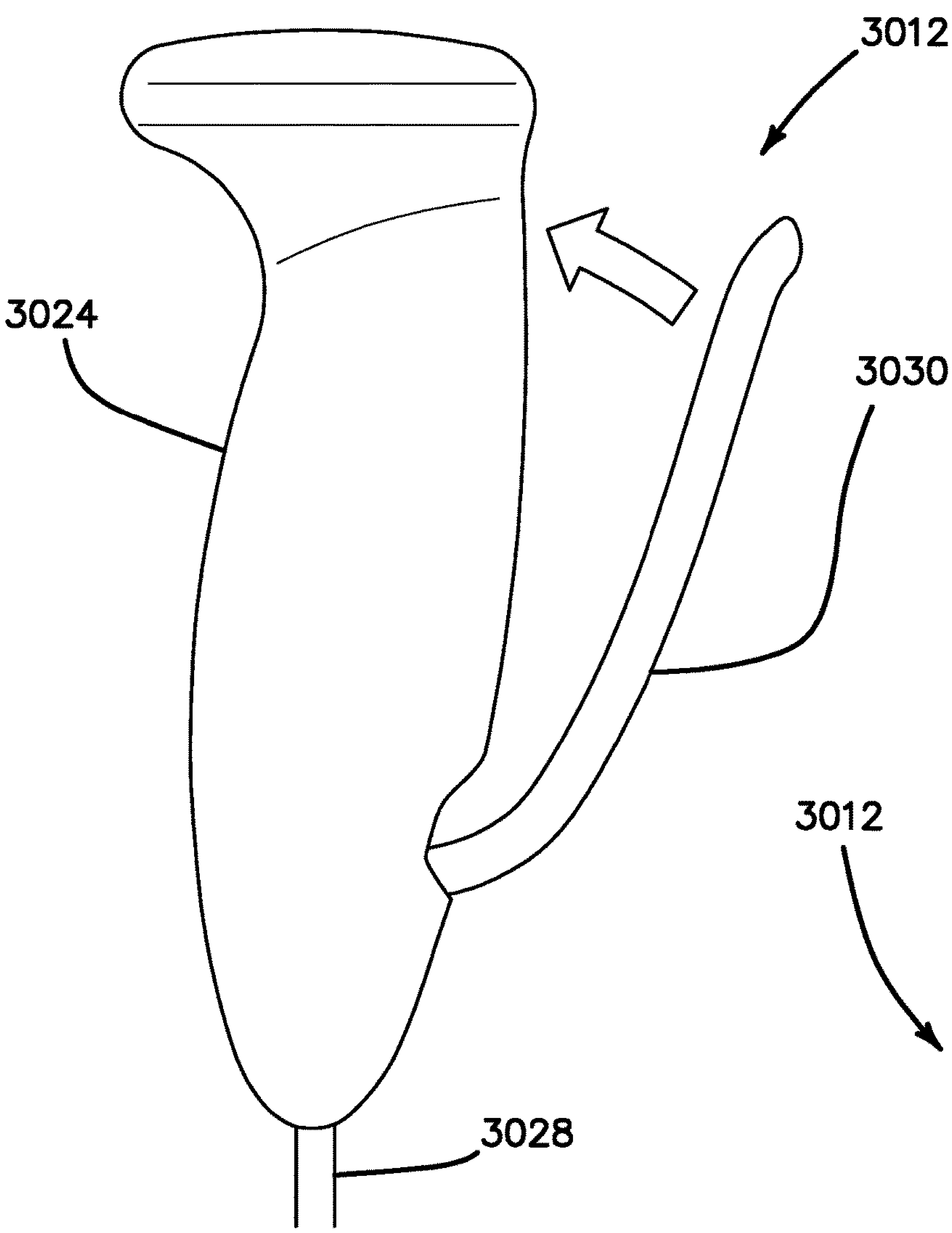


FIG. 129

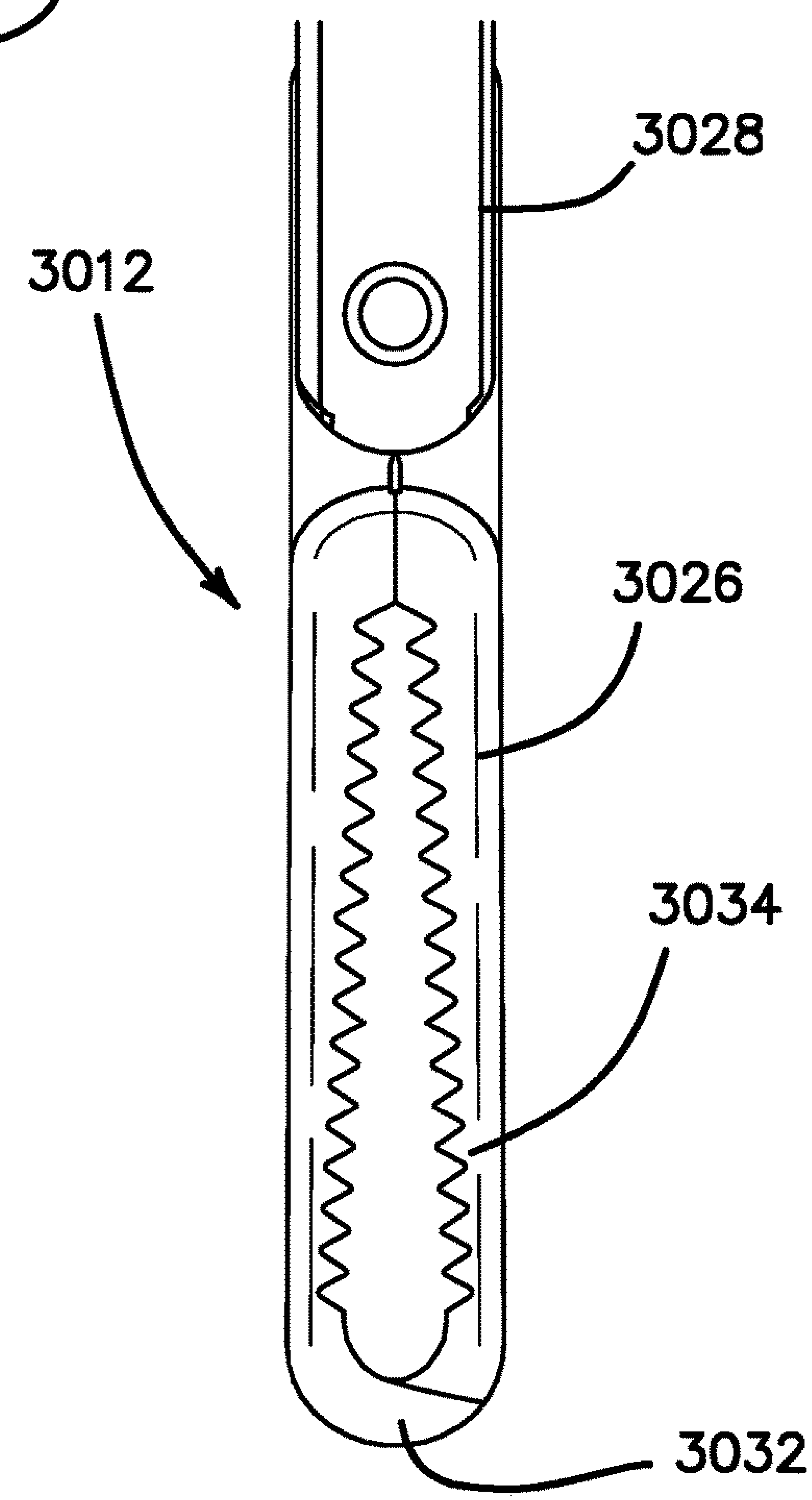
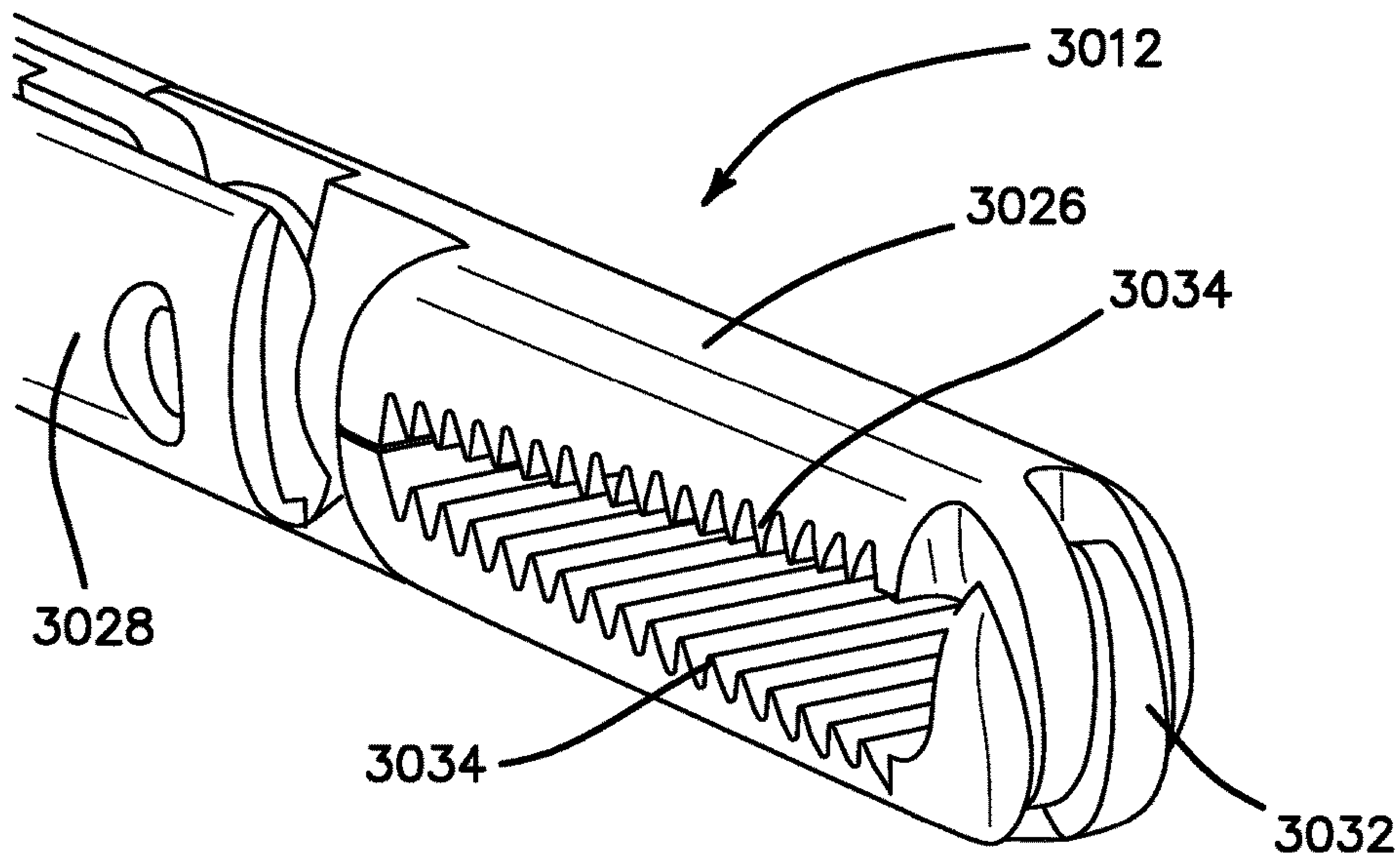


FIG. 130

FIG. 131



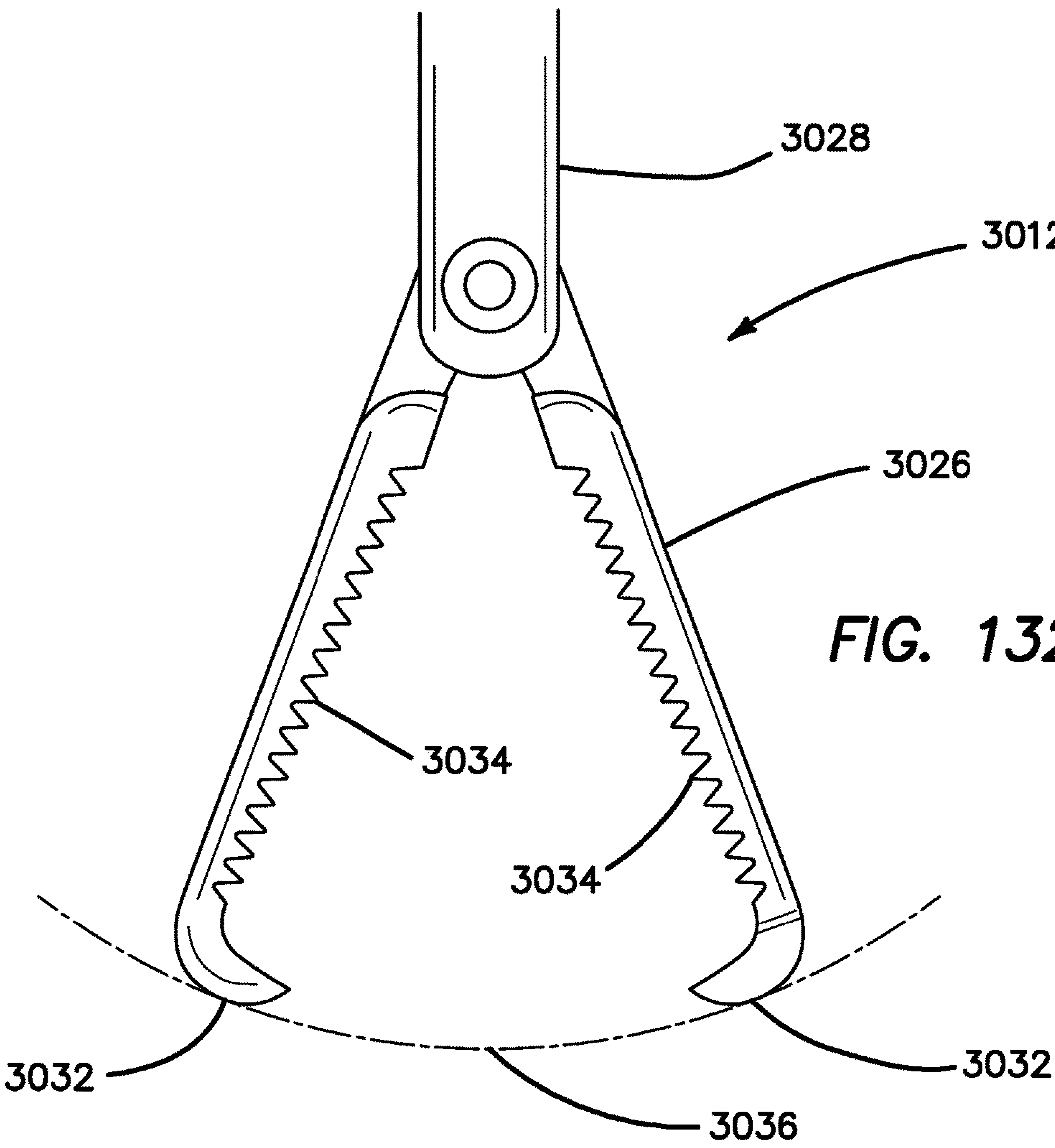


FIG. 132

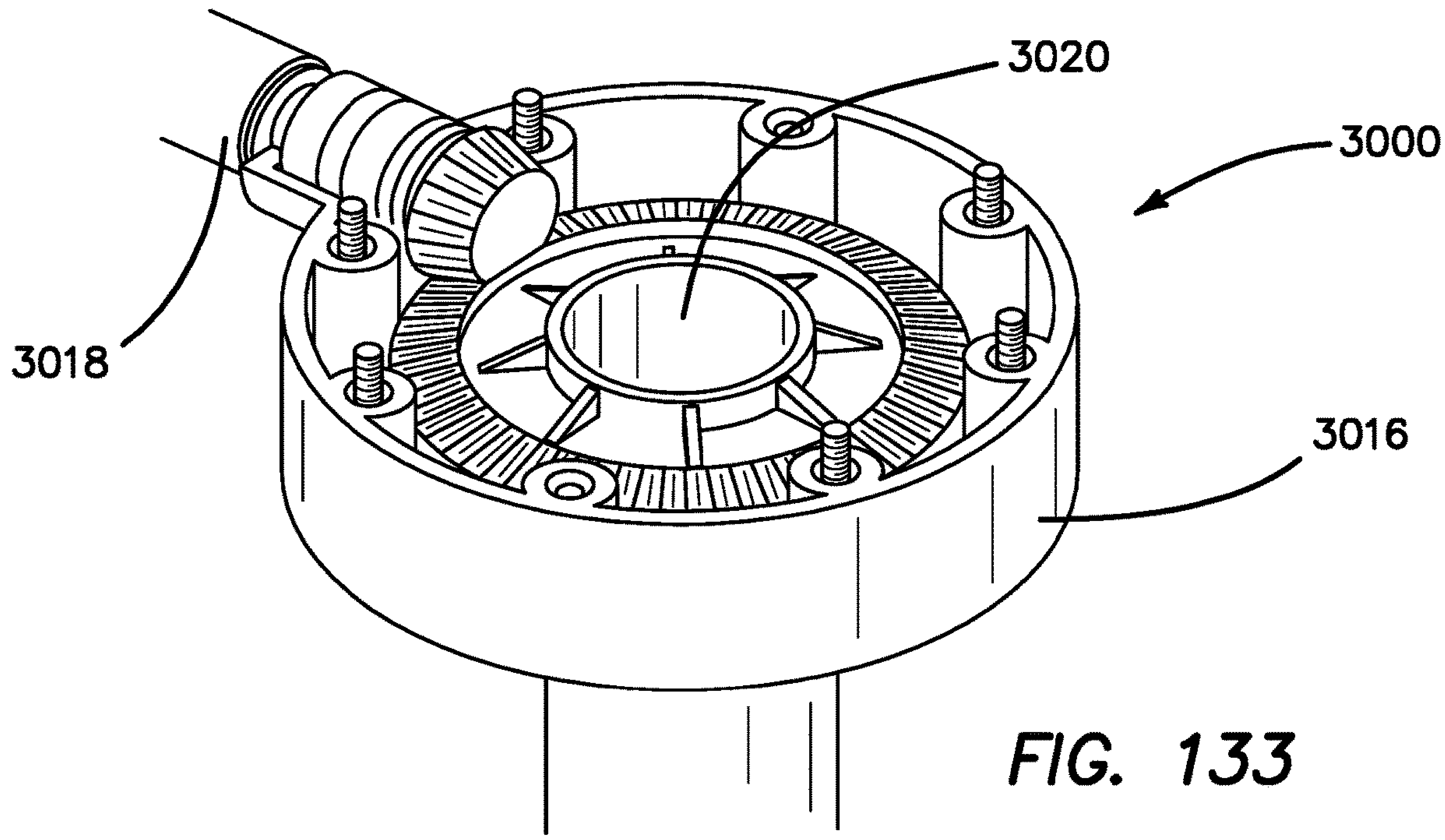


FIG. 133

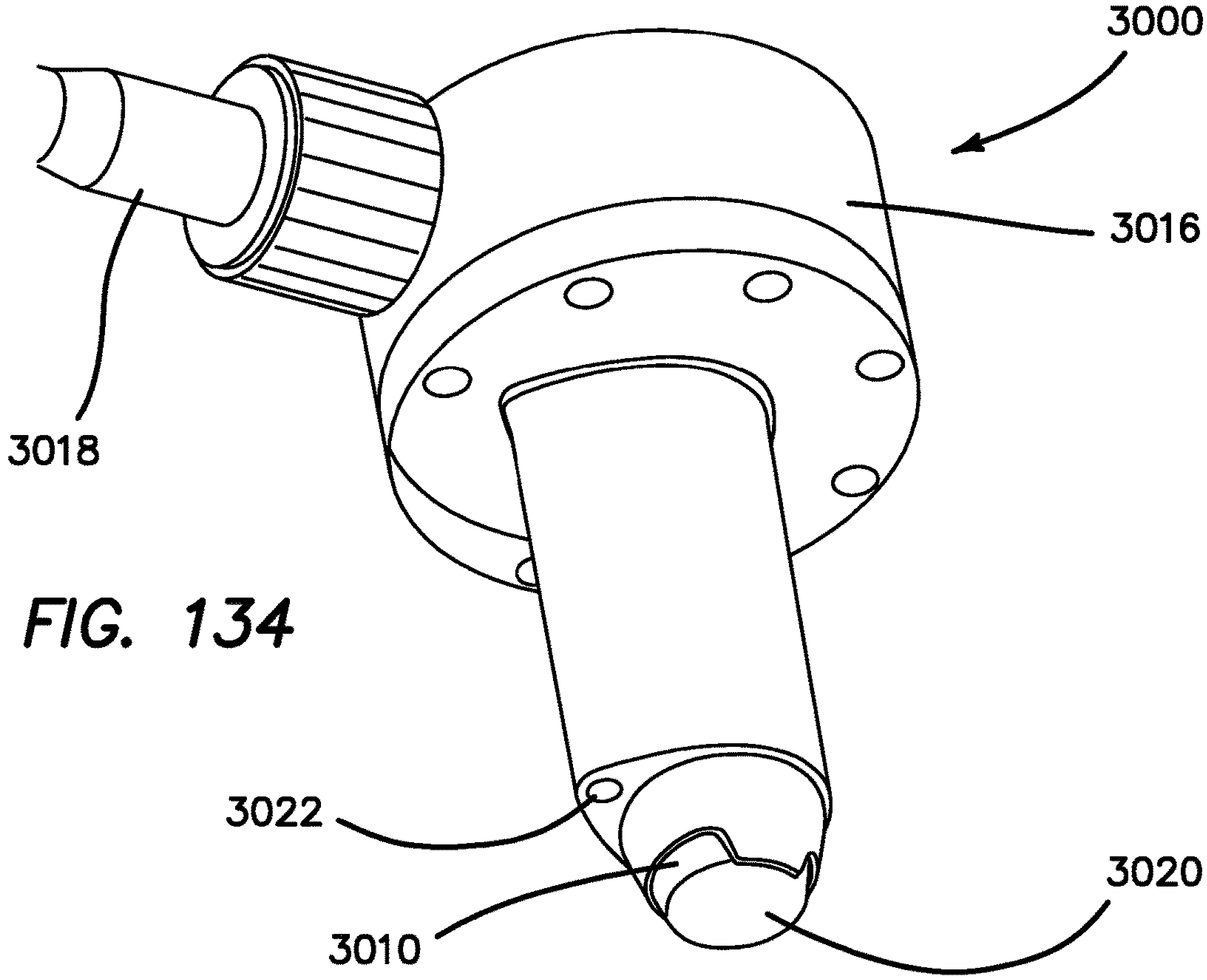


FIG. 134

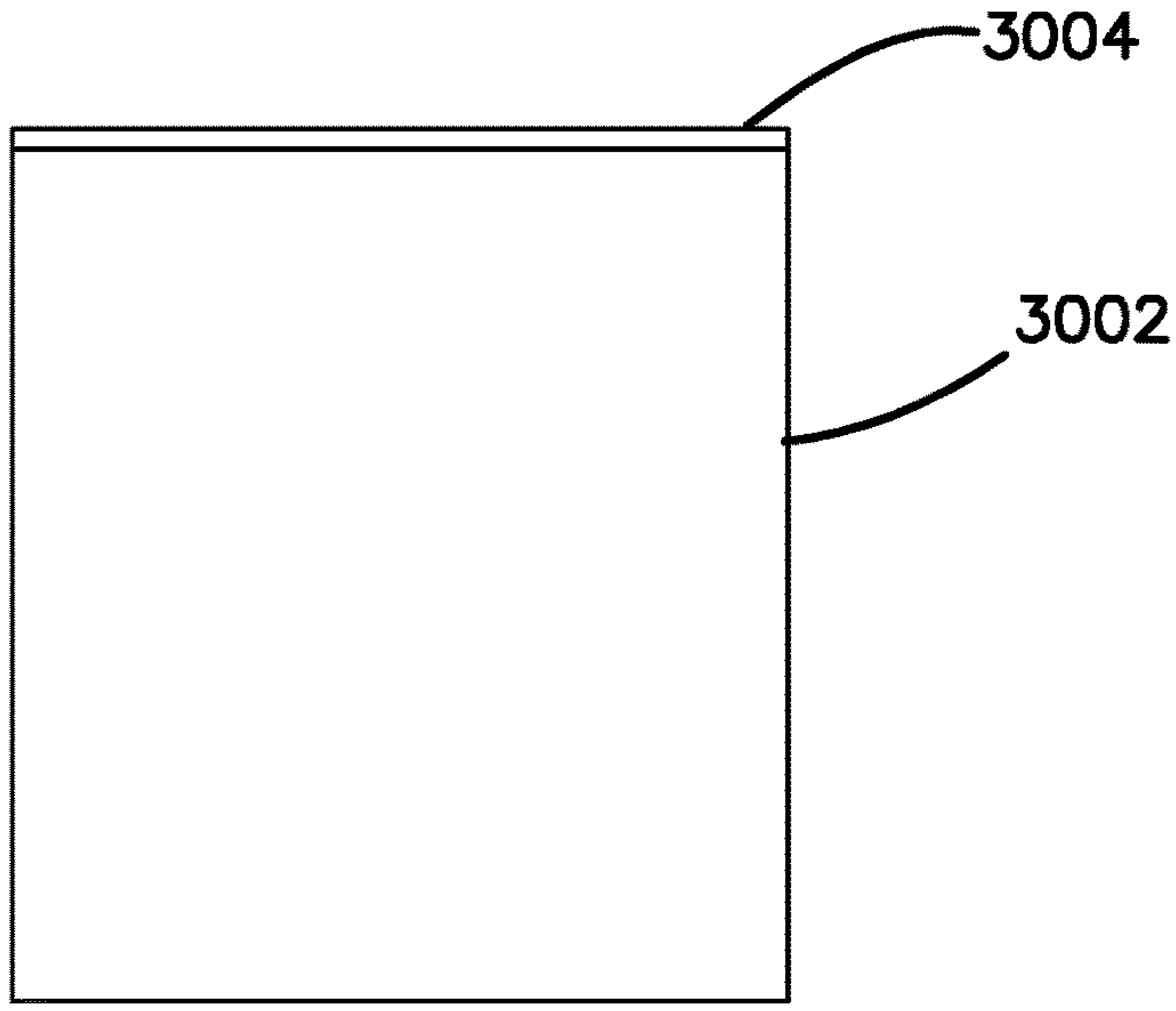


FIG. 135A

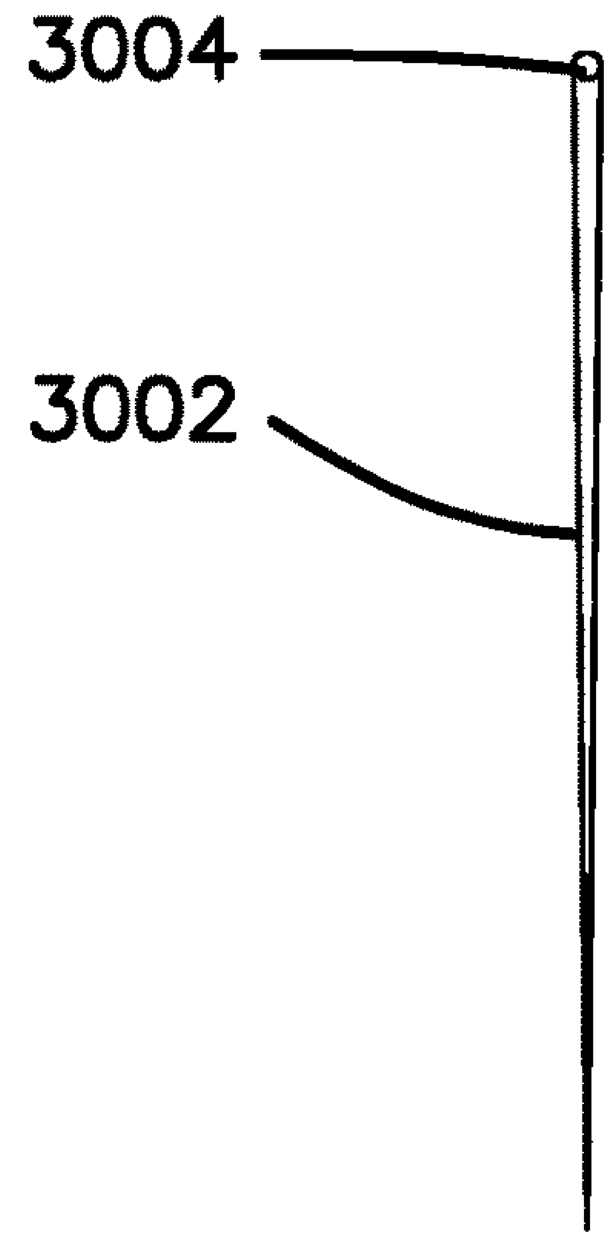


FIG. 135D

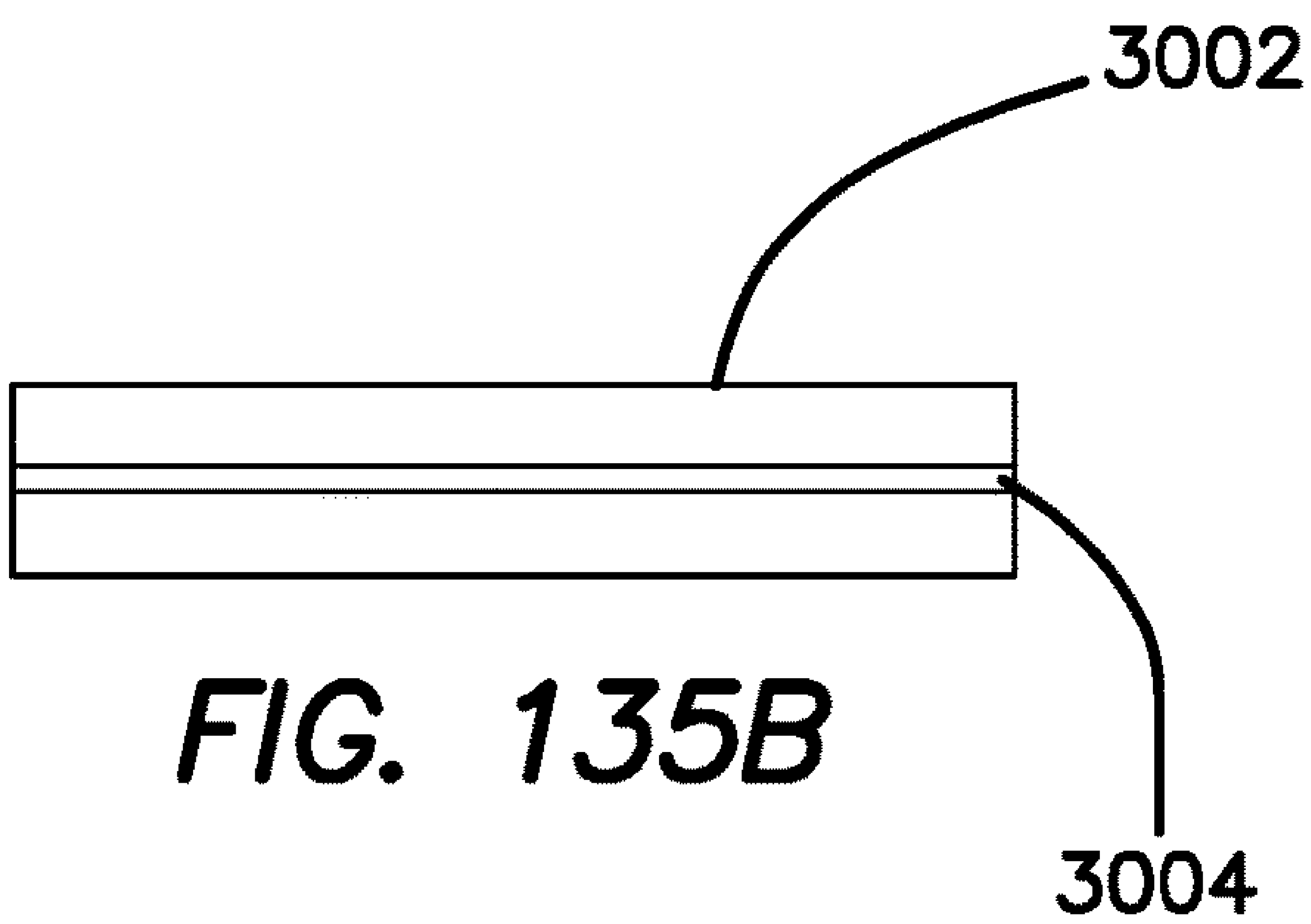


FIG. 135B

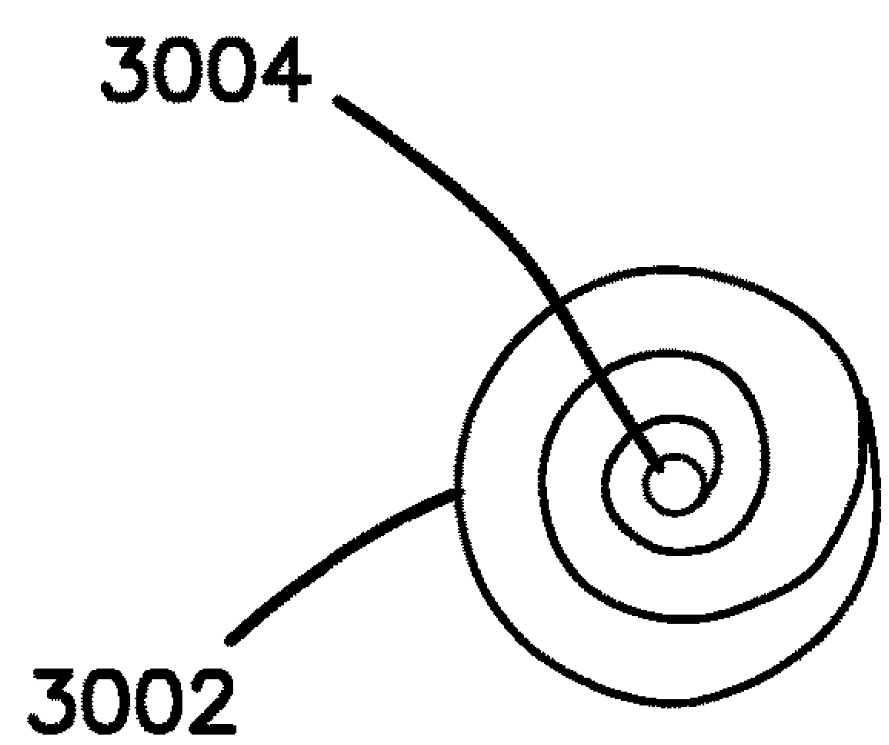


FIG. 135C

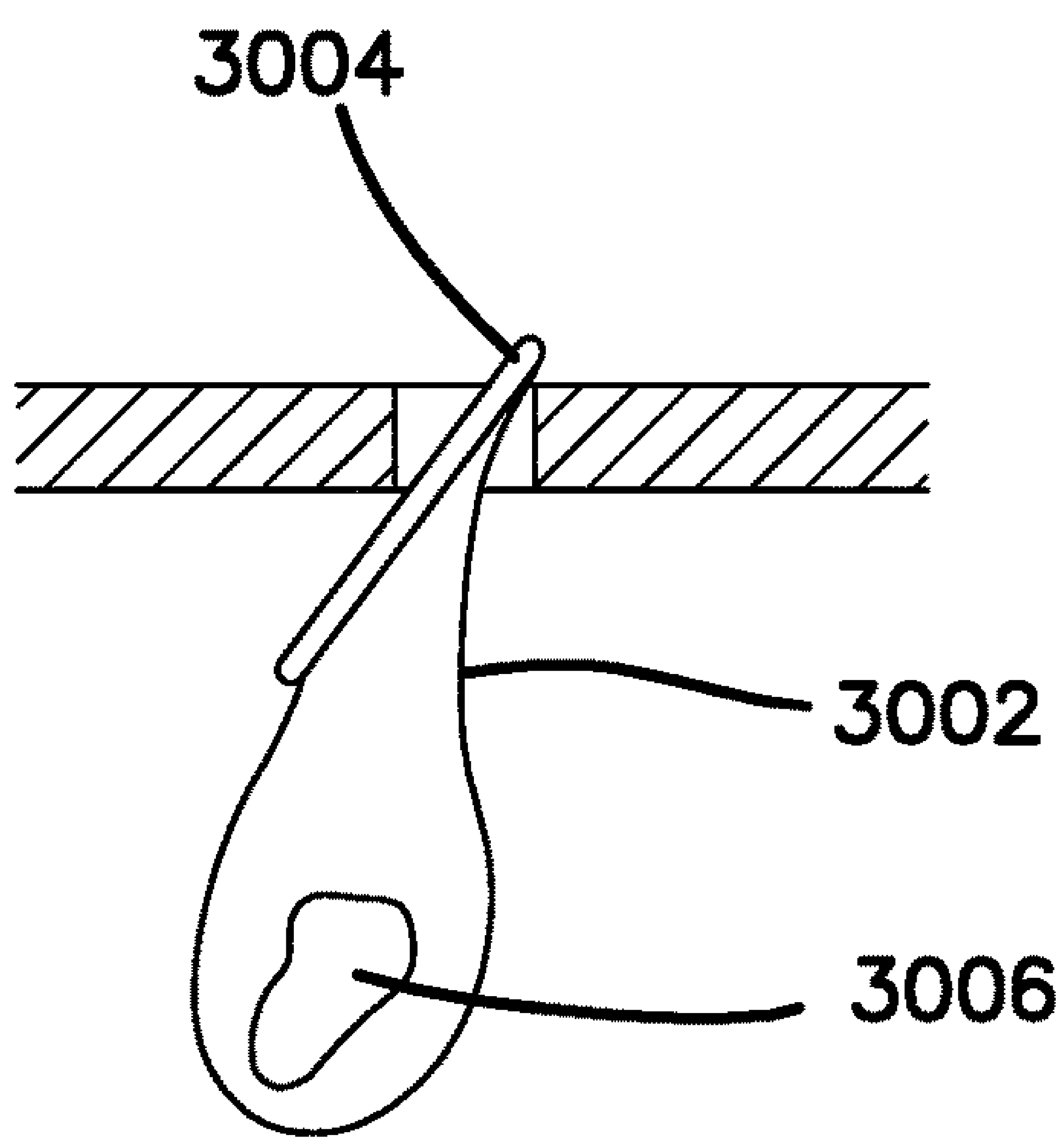


FIG. 136A

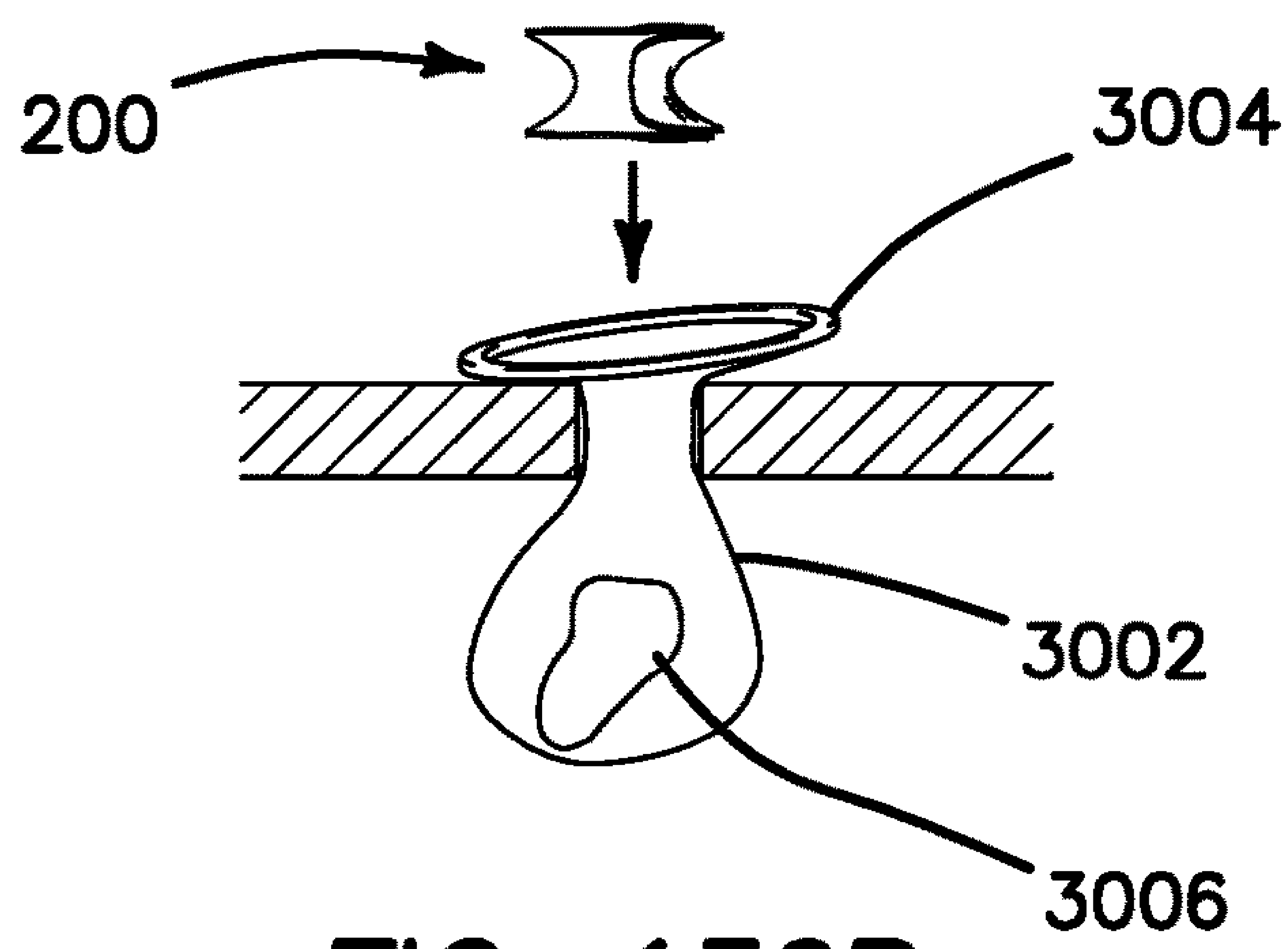


FIG. 136B

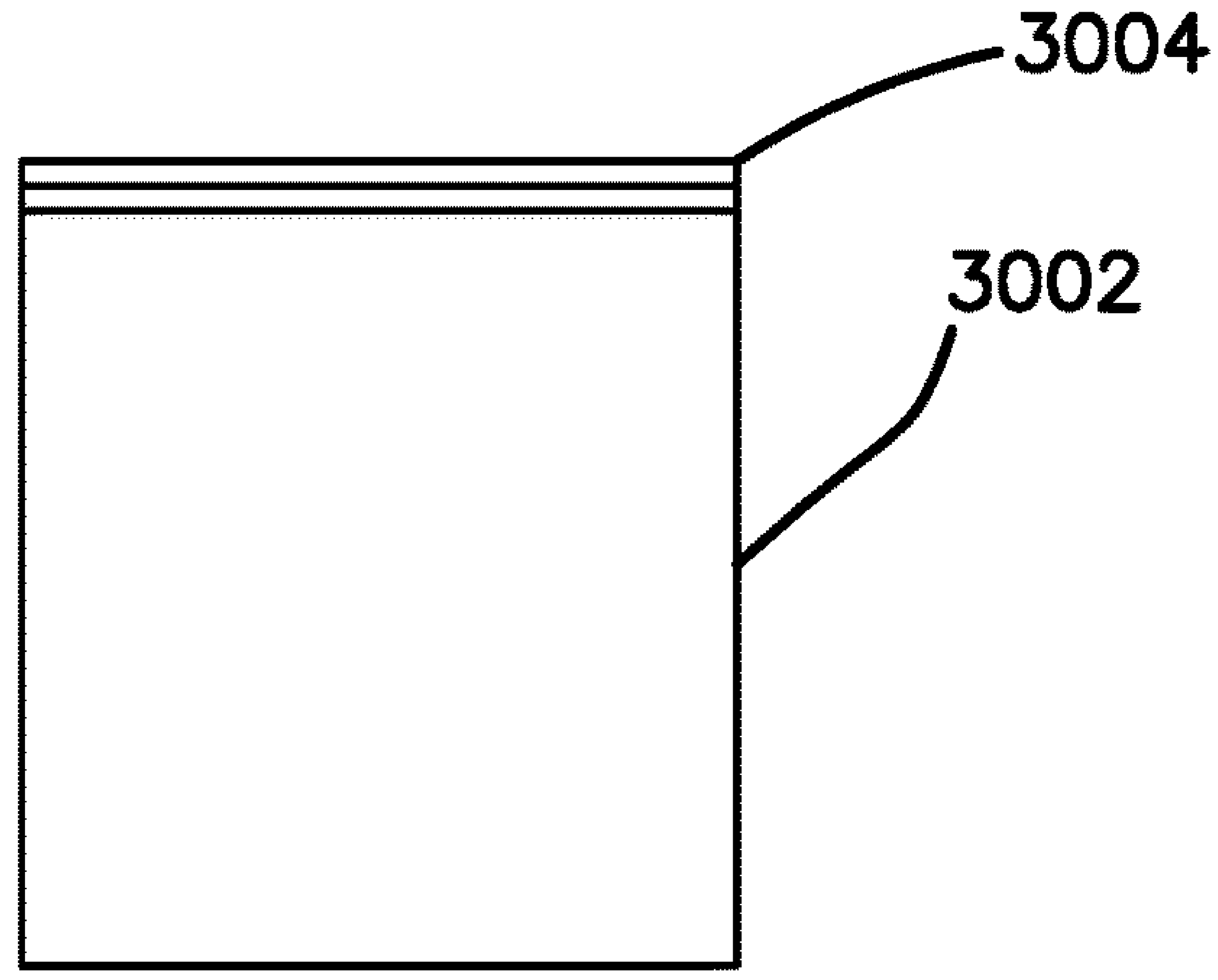


FIG. 137A

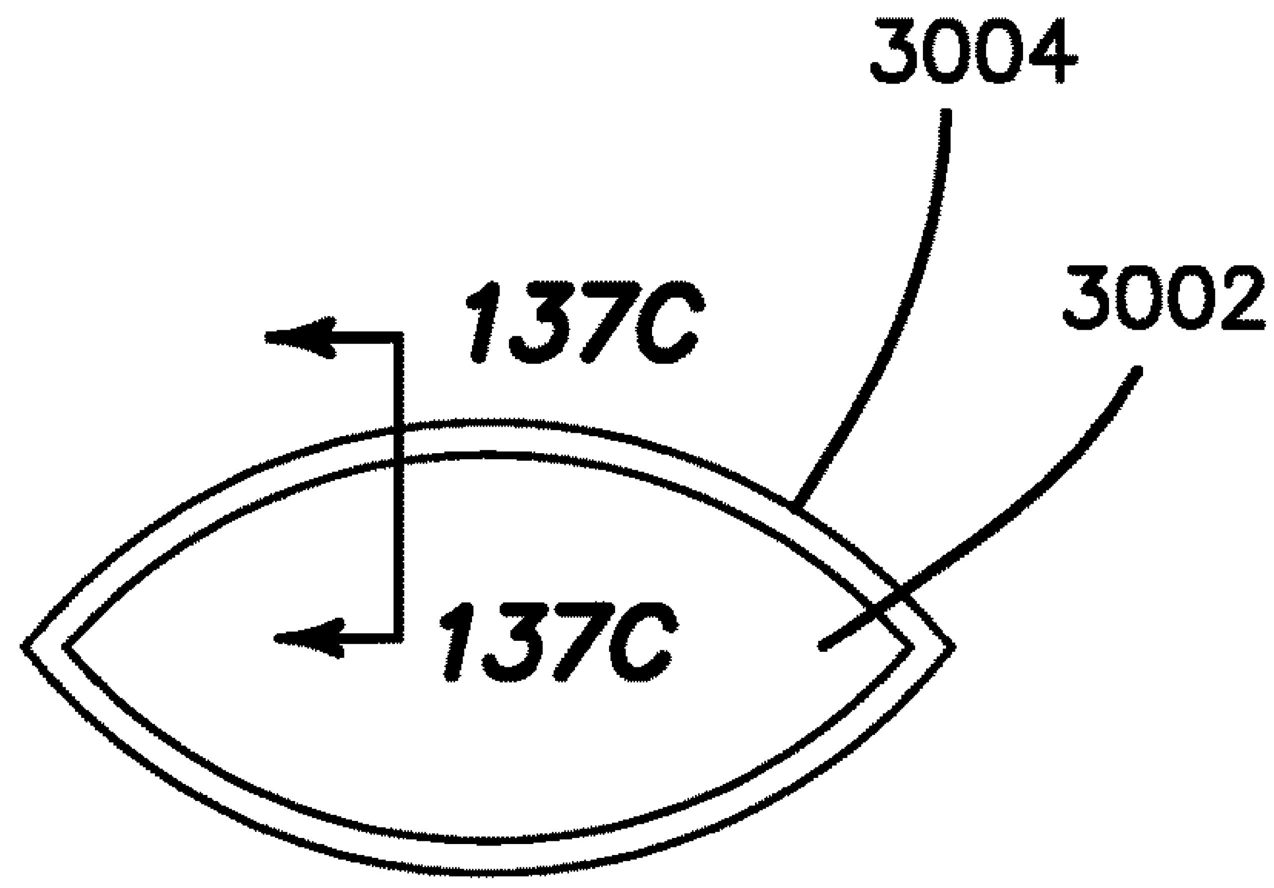


FIG. 137B

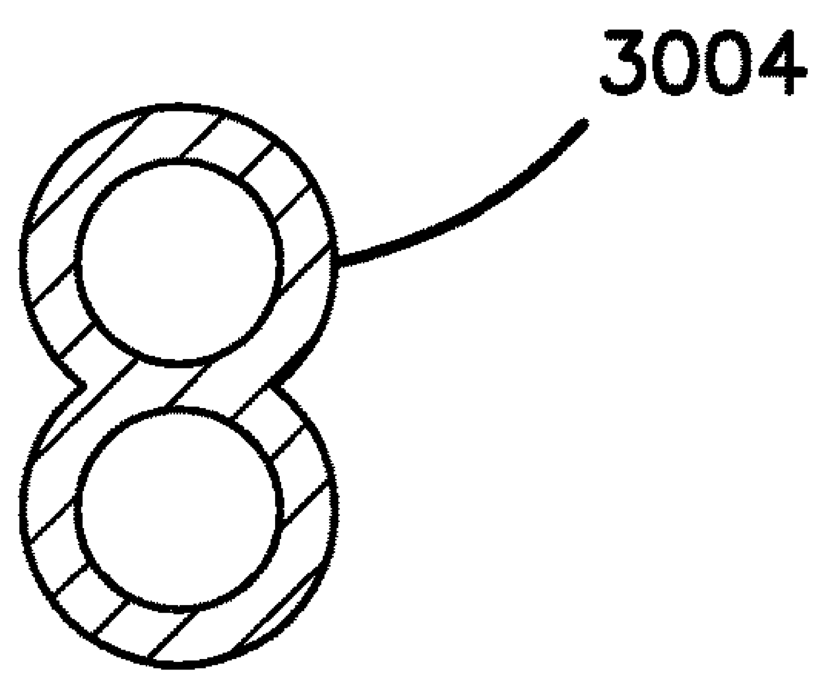


FIG. 137C

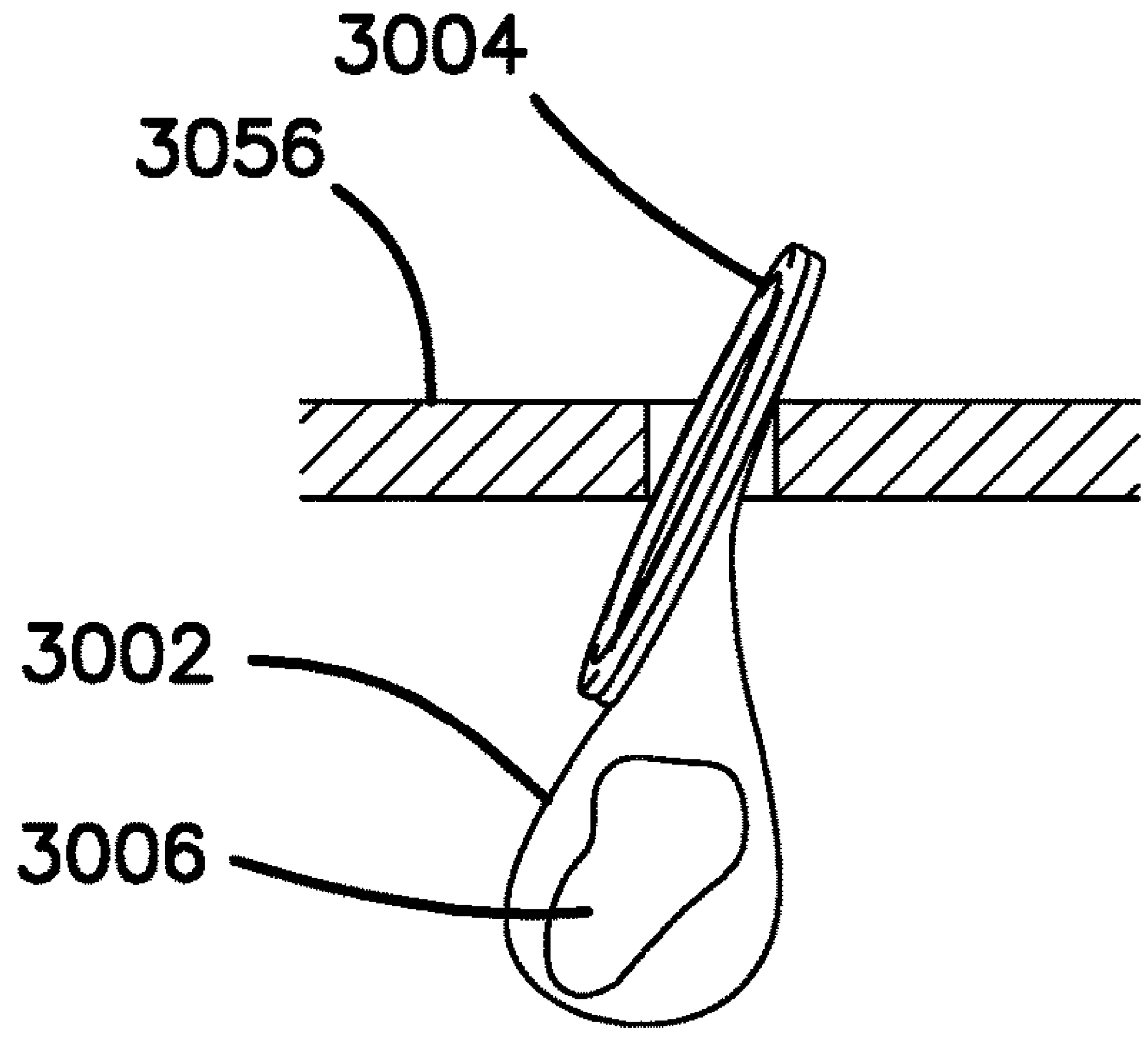


FIG. 138A

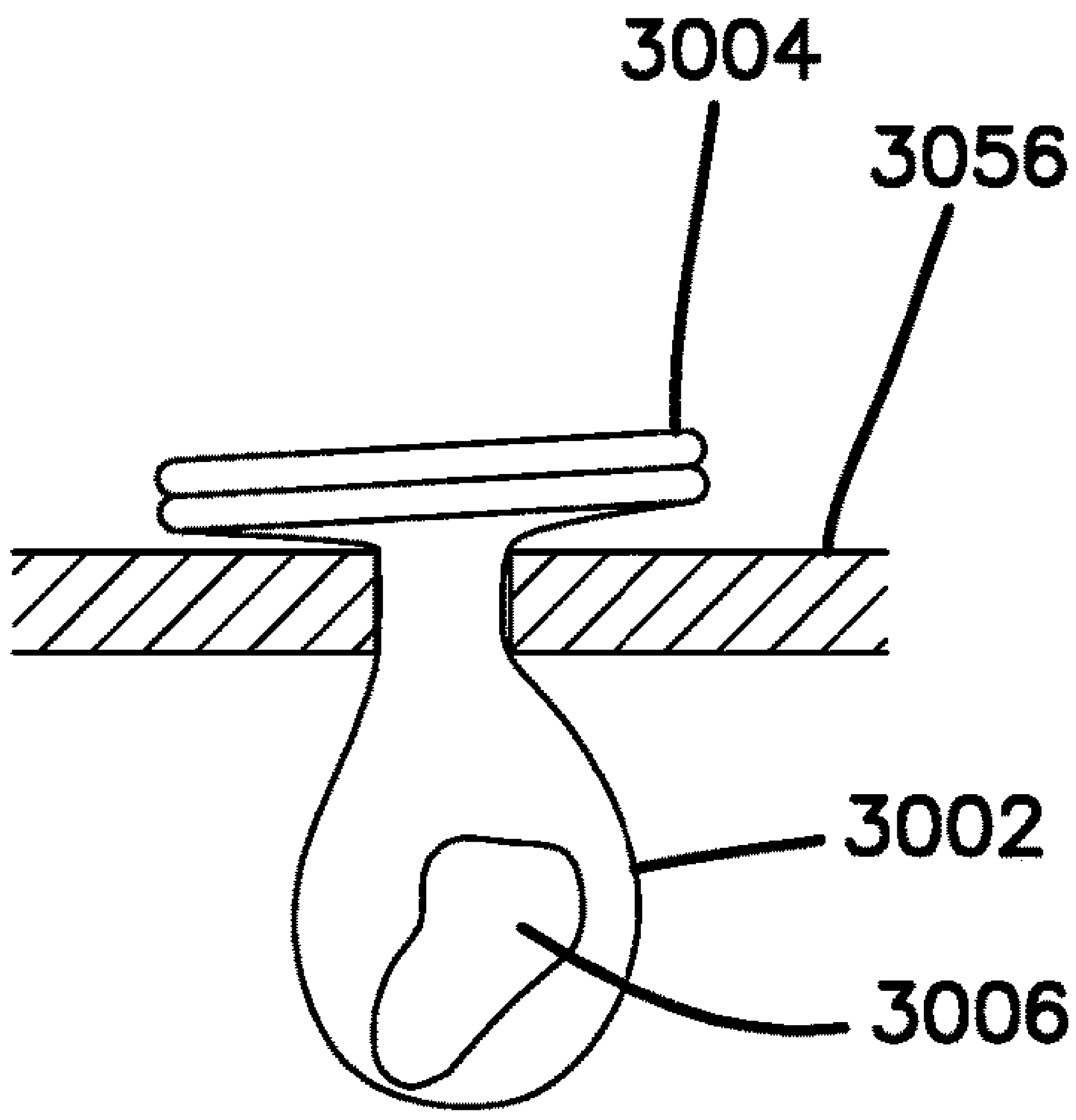


FIG. 138B

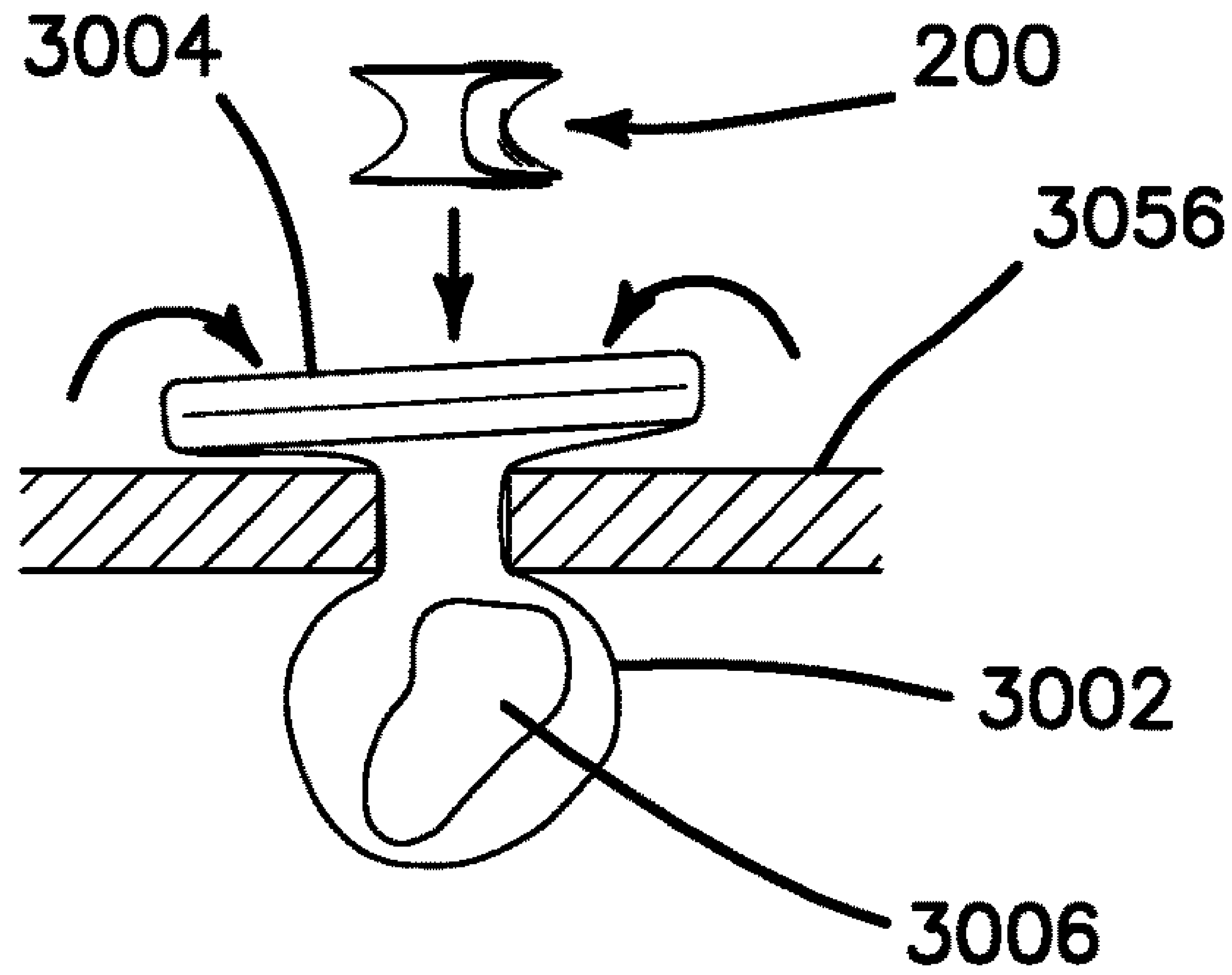


FIG. 138C

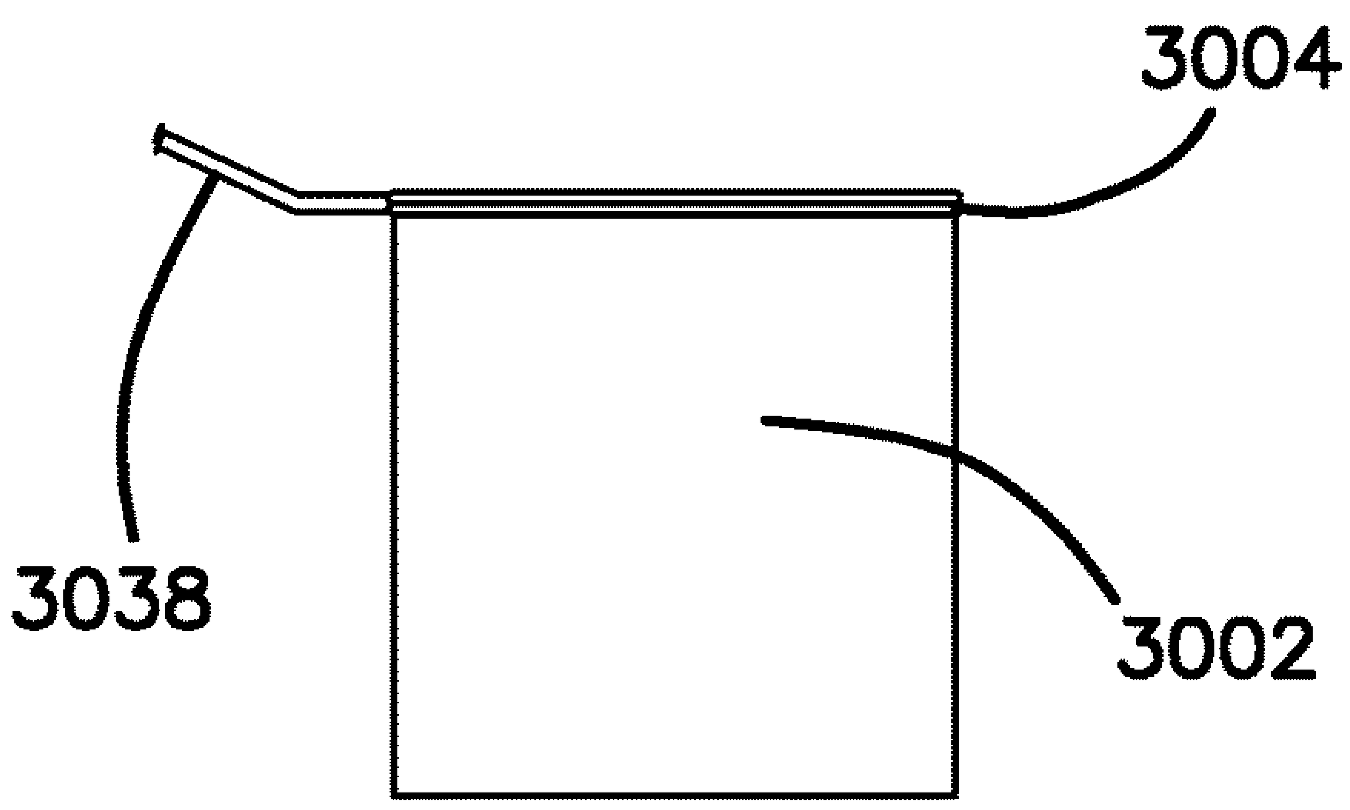


FIG. 139A

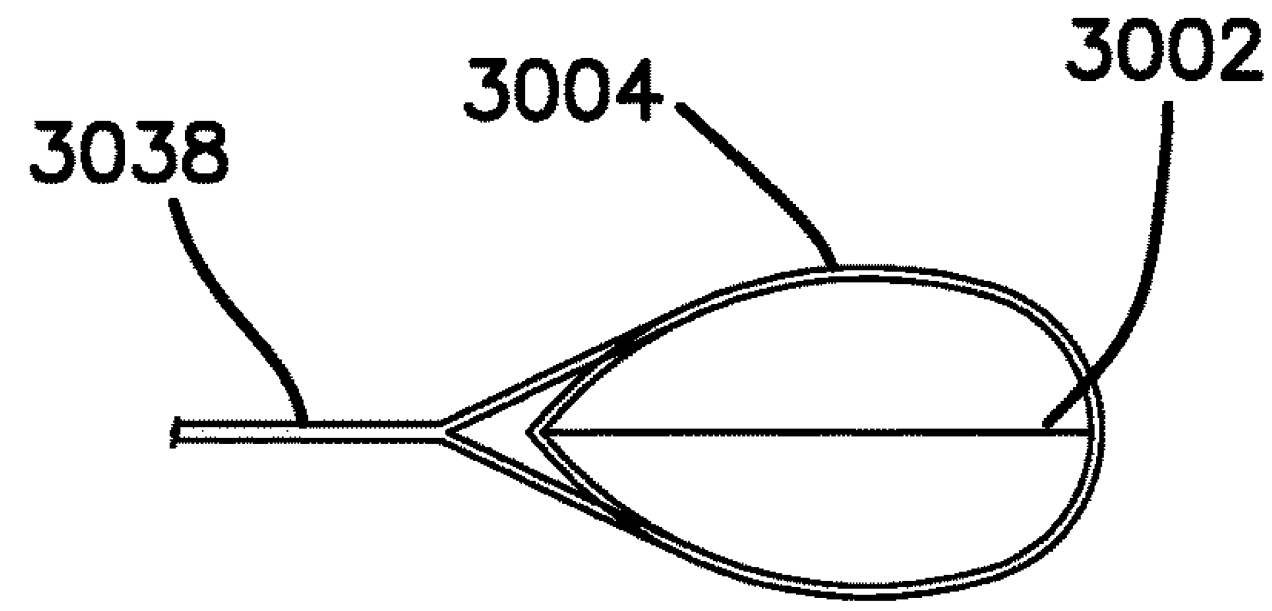


FIG. 139B

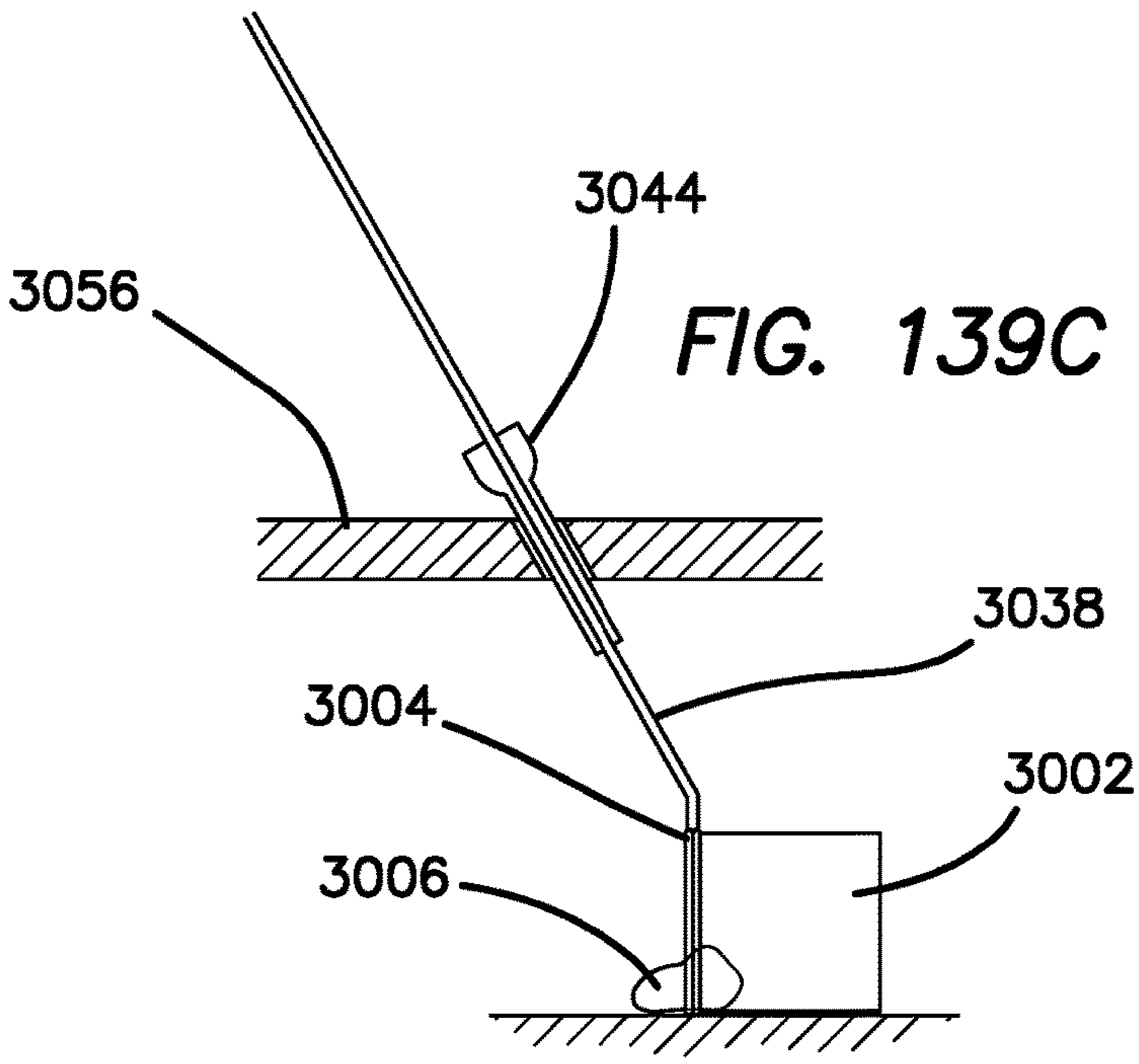


FIG. 139C

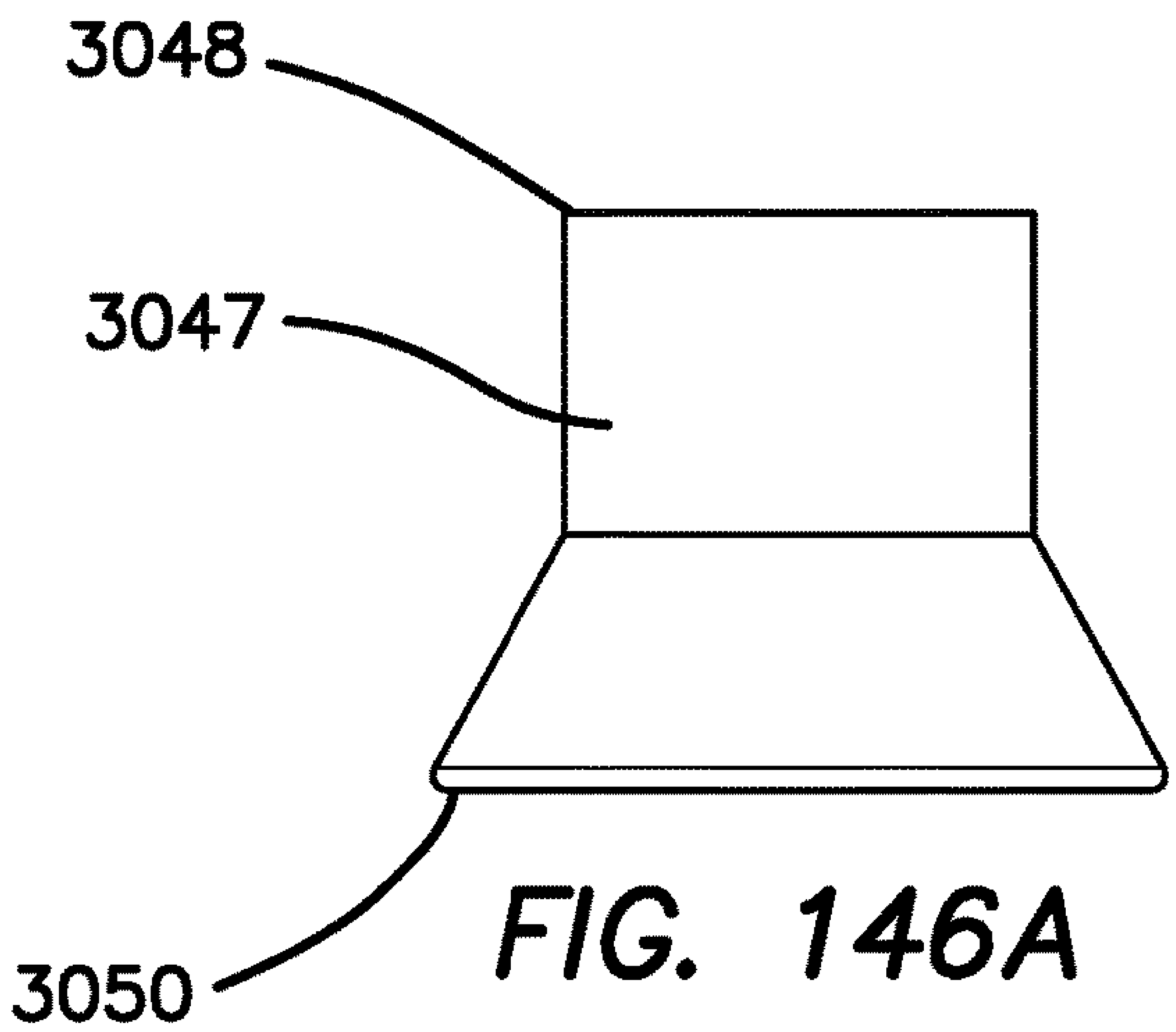


FIG. 146A

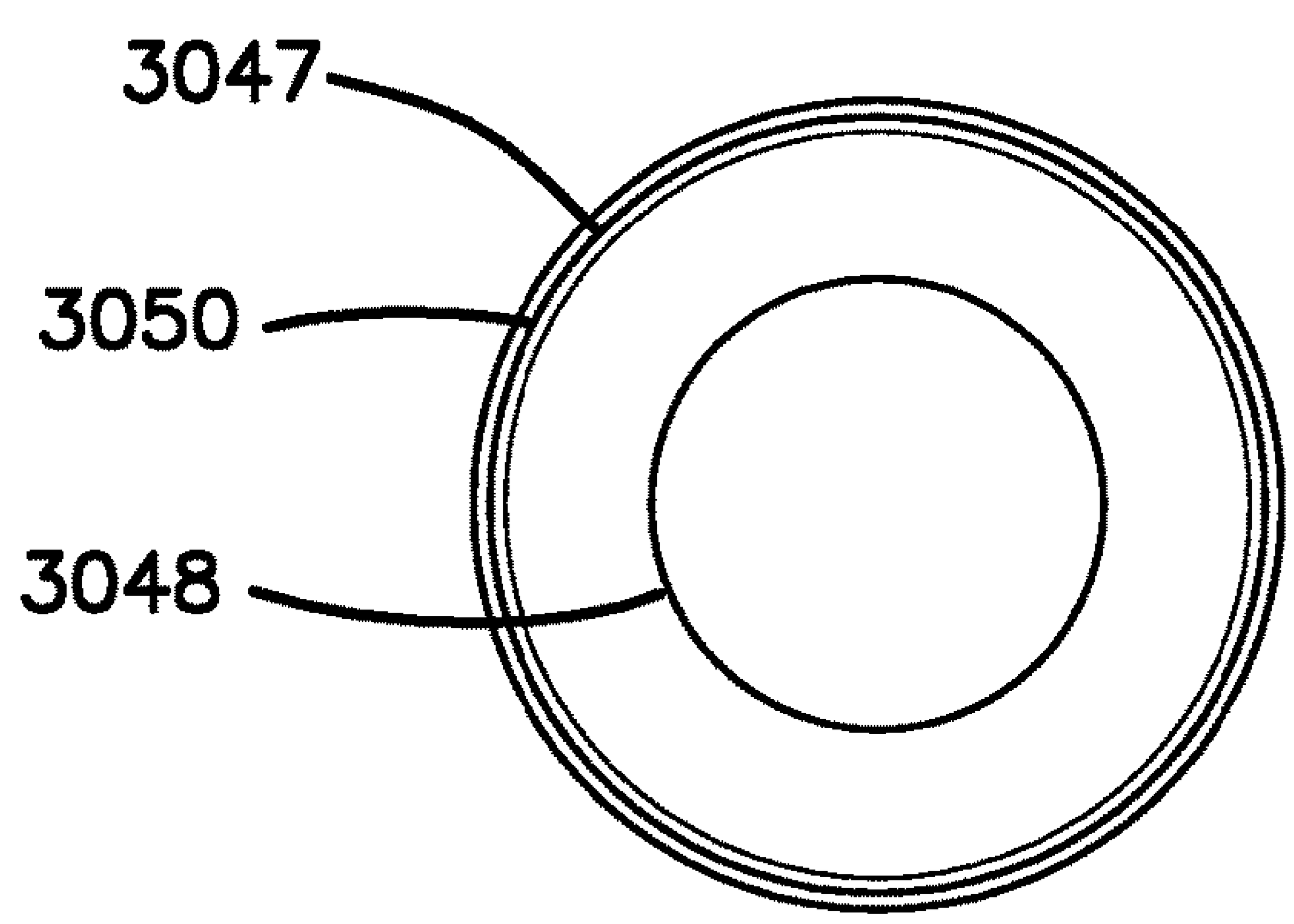
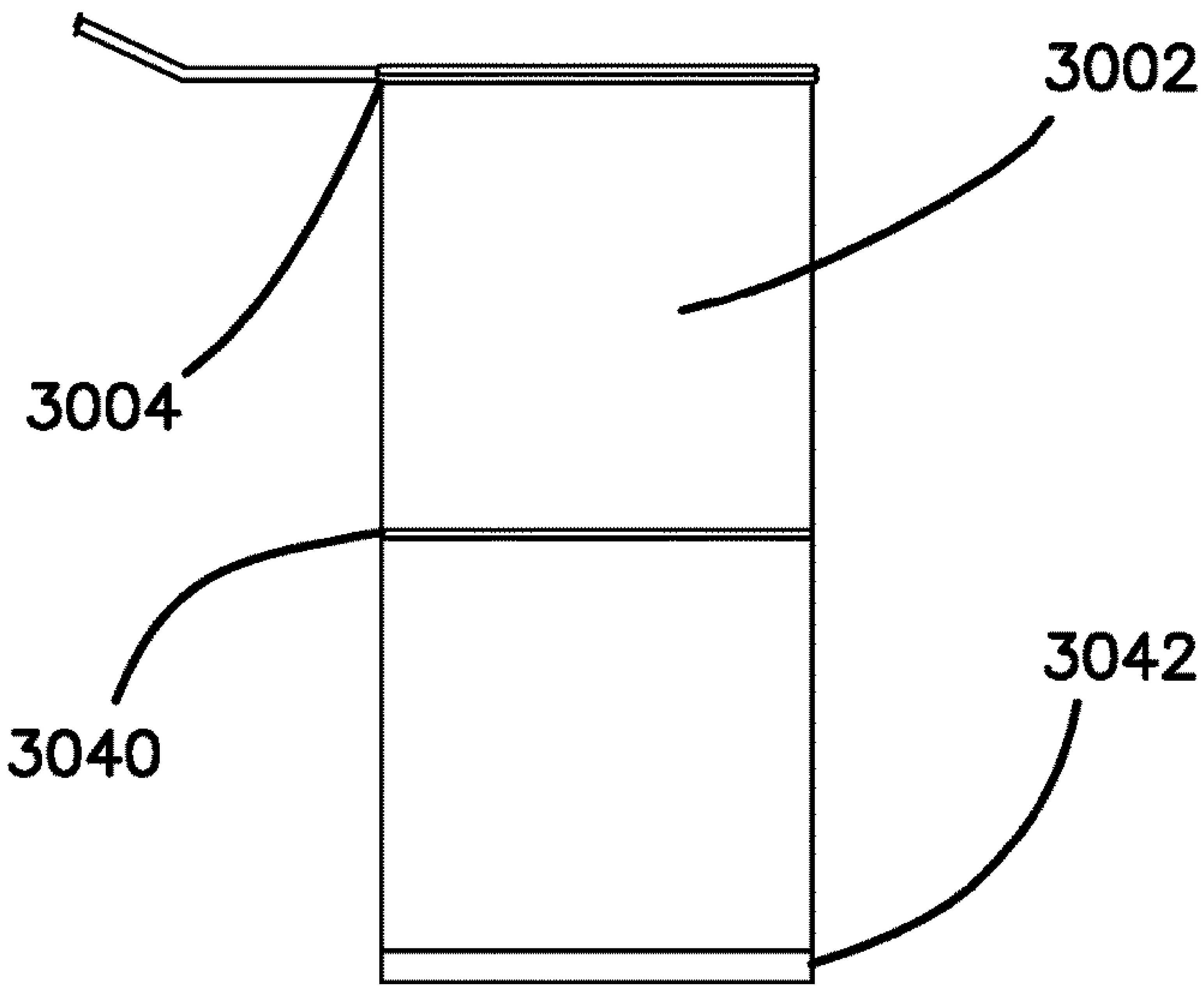


FIG. 146B

FIG. 140A



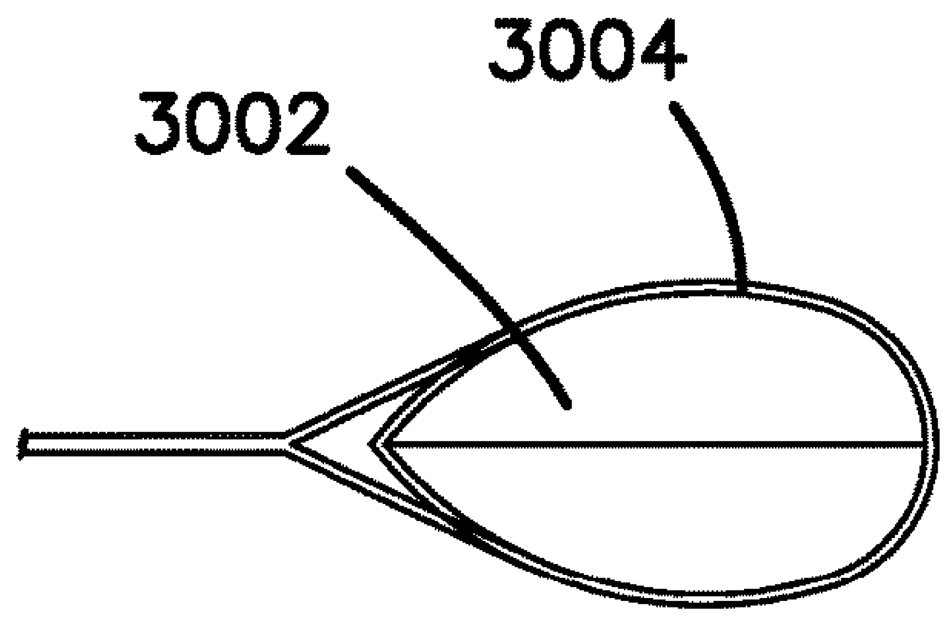


FIG. 140B

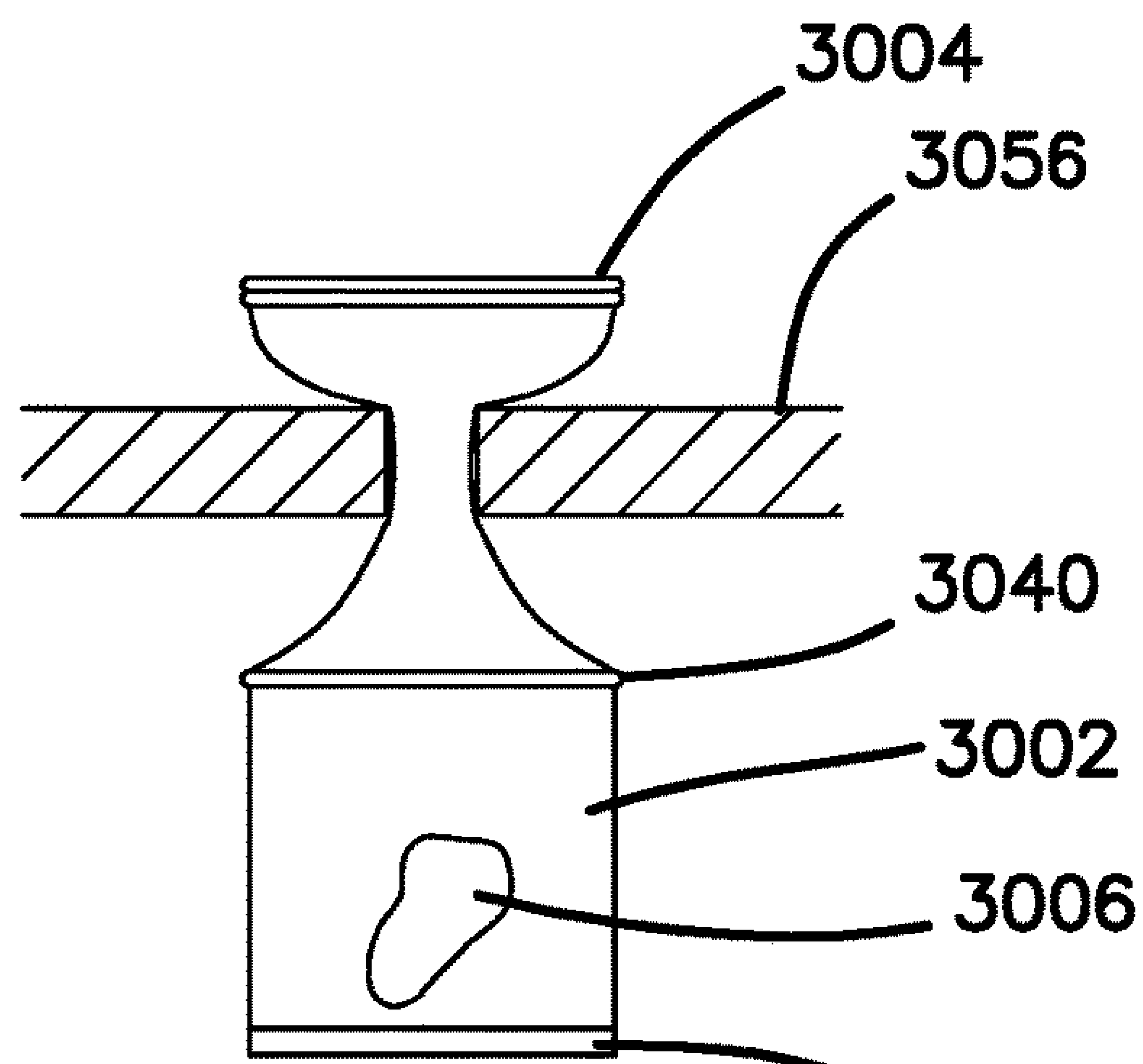


FIG. 141A

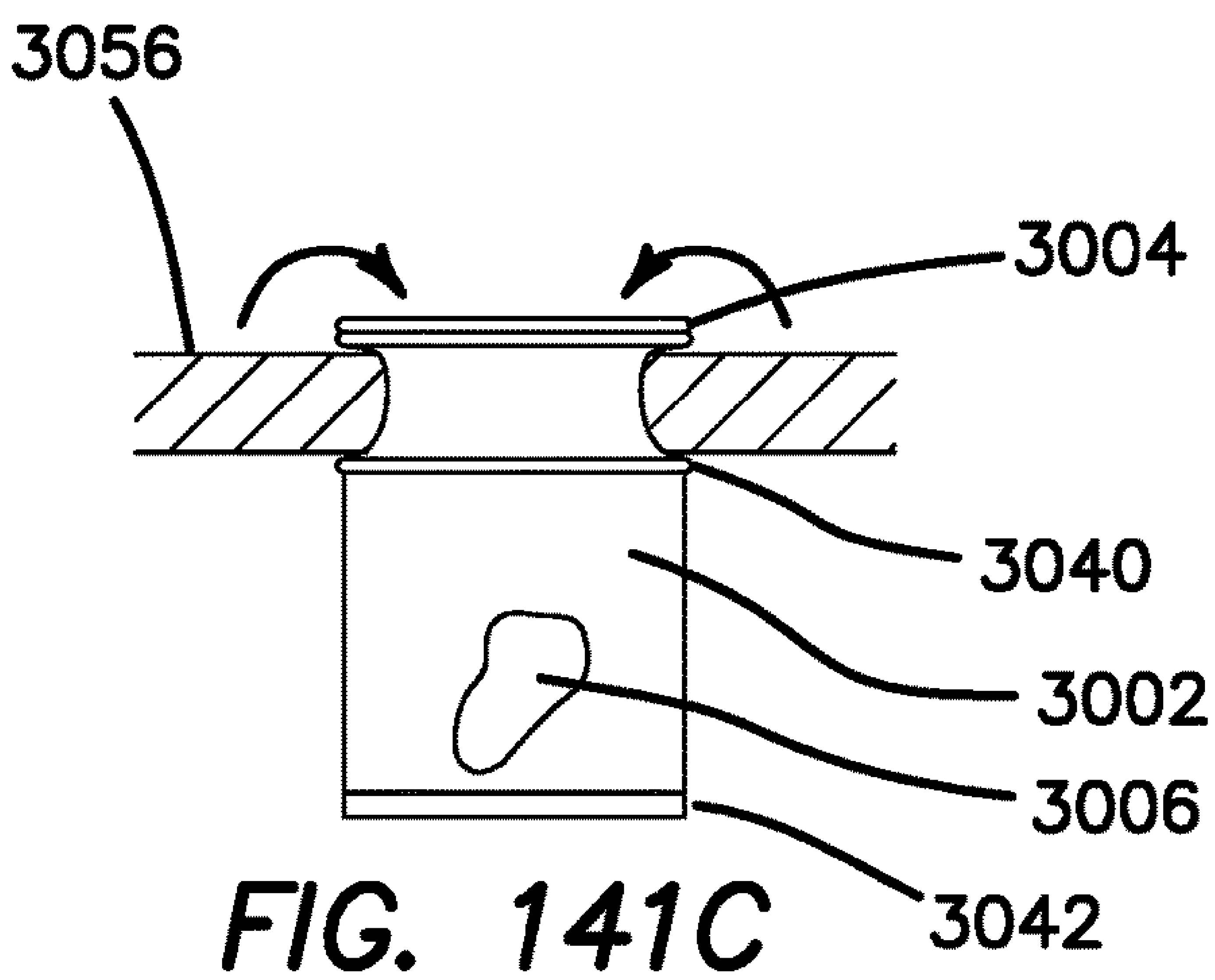


FIG. 141C

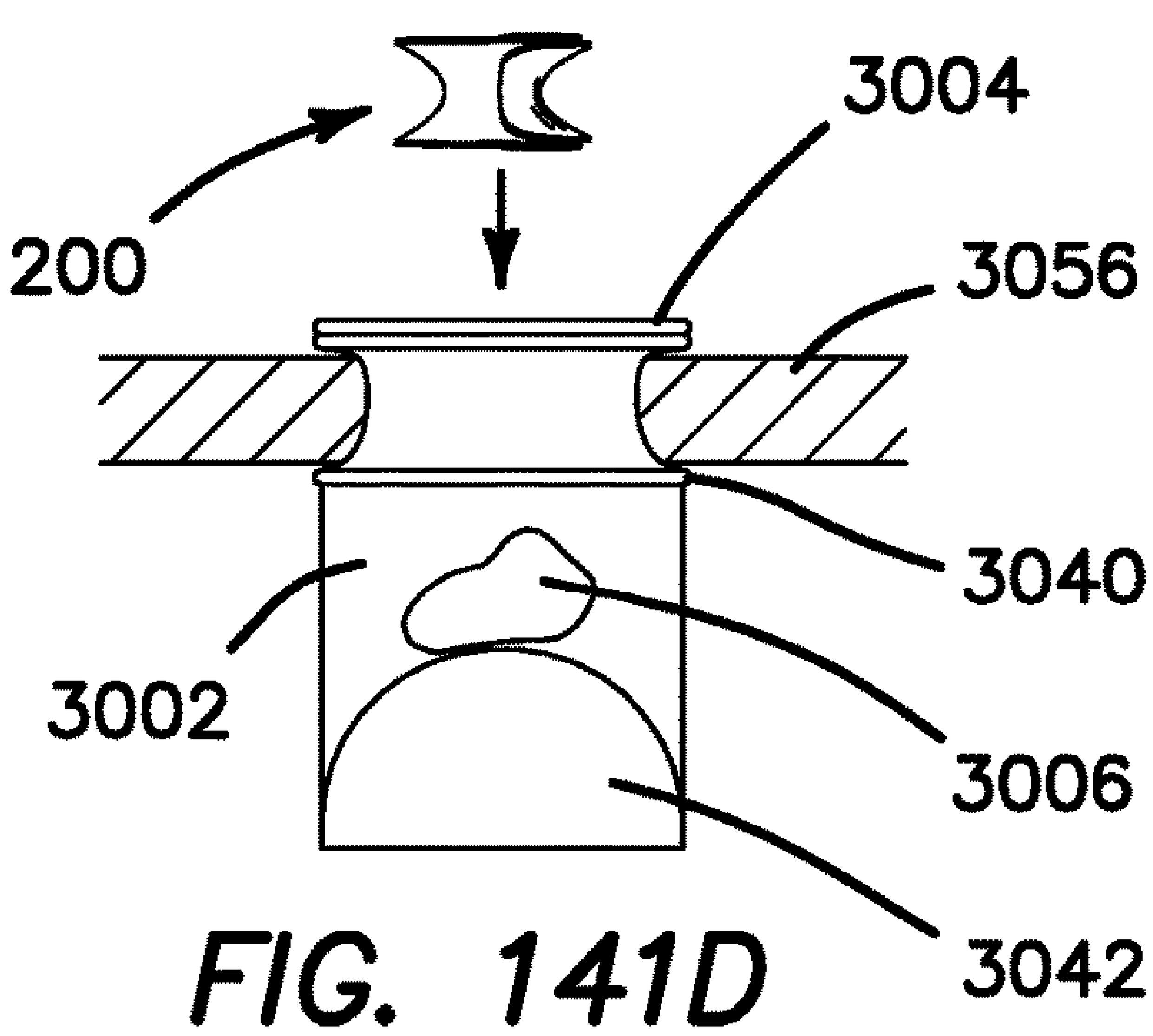


FIG. 141D

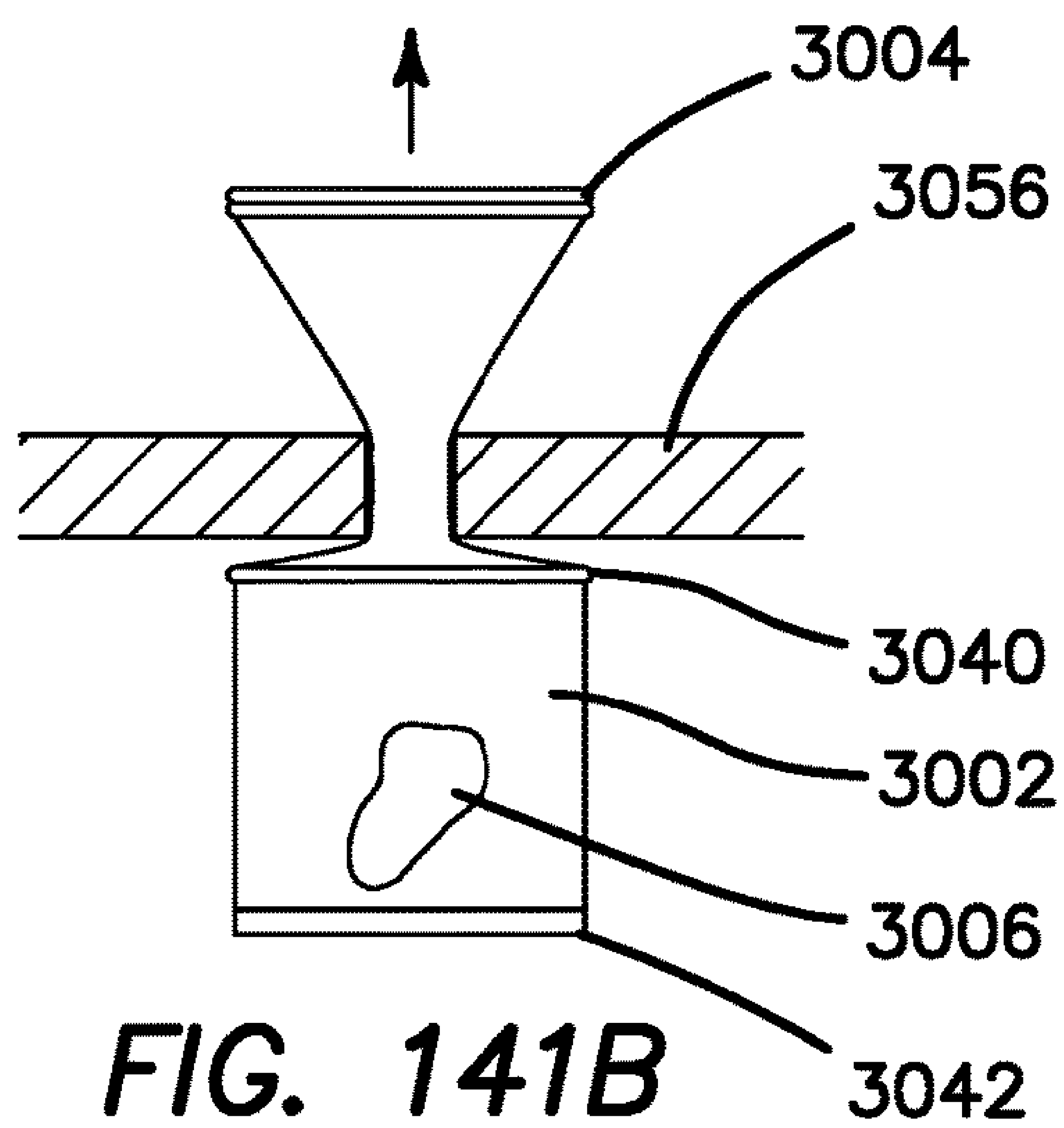


FIG. 141B

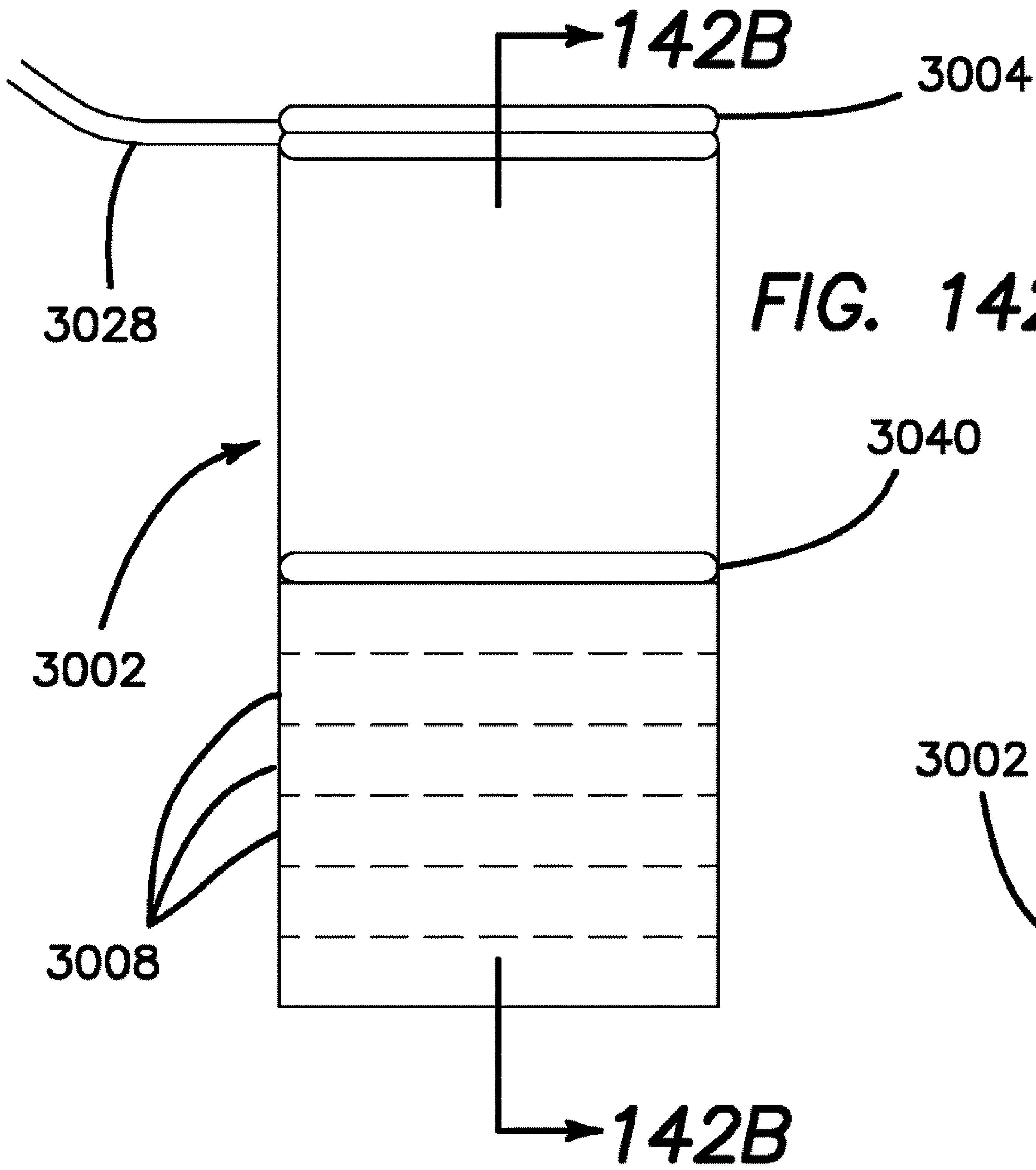


FIG. 142A

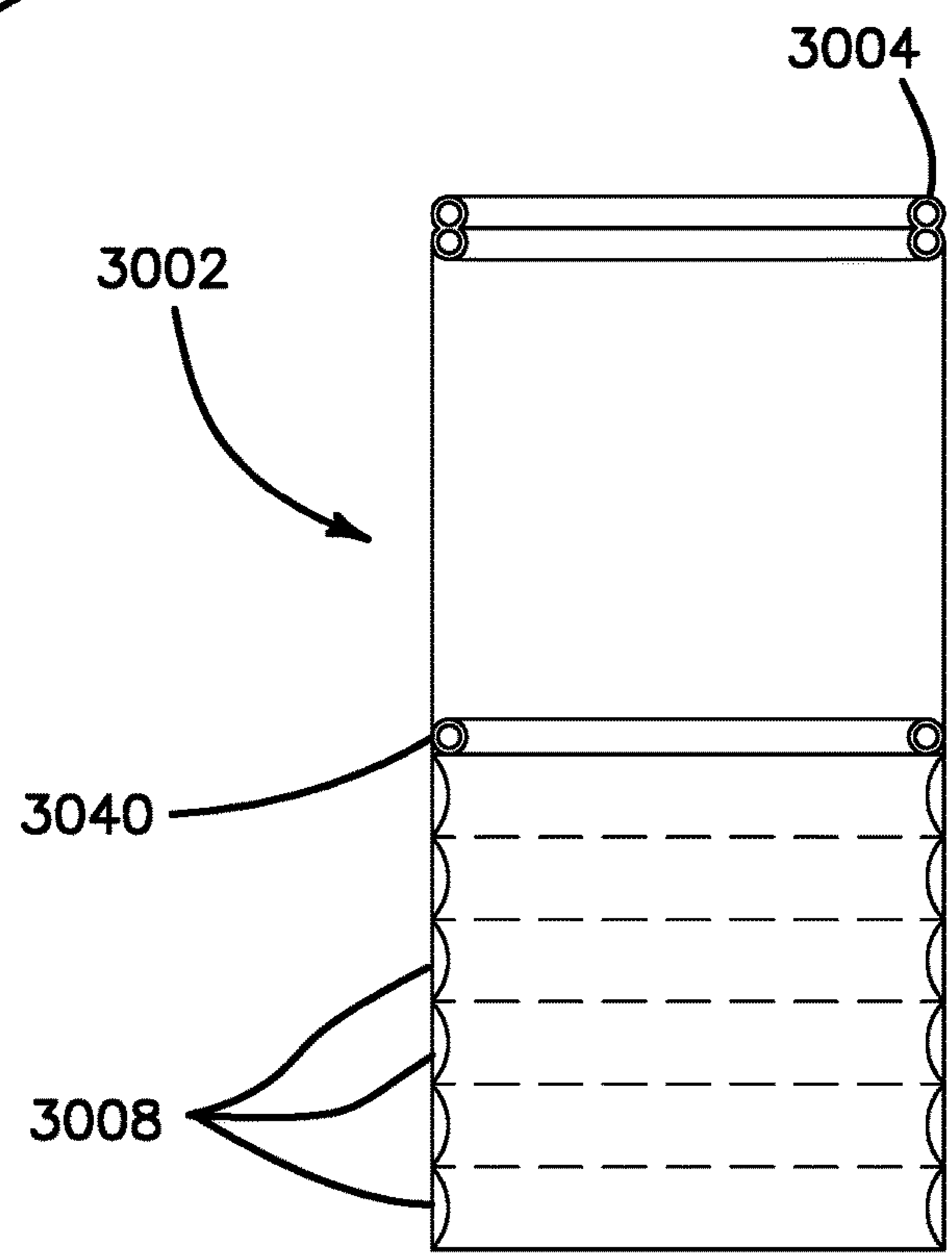
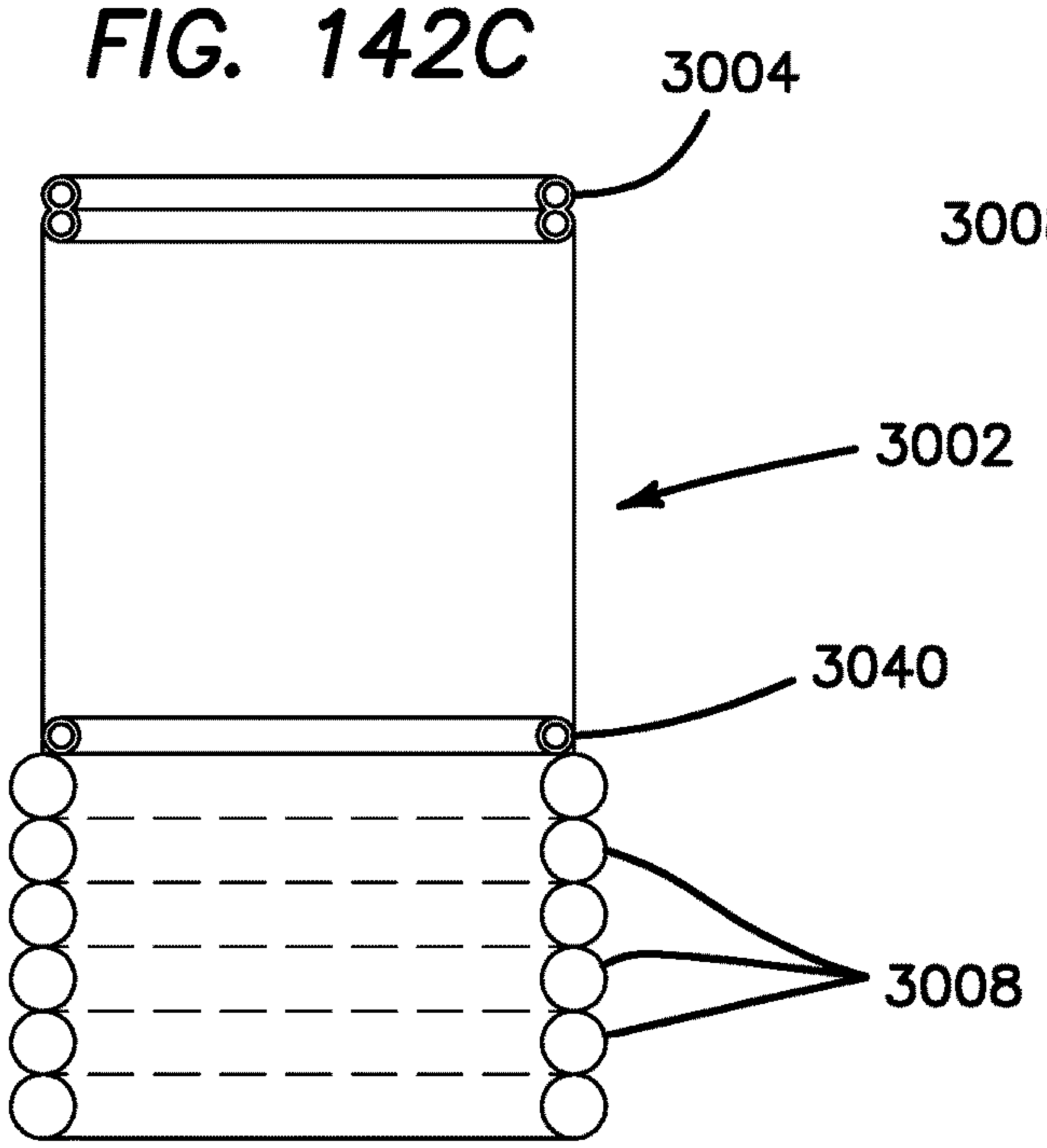


FIG. 142B

FIG. 142C



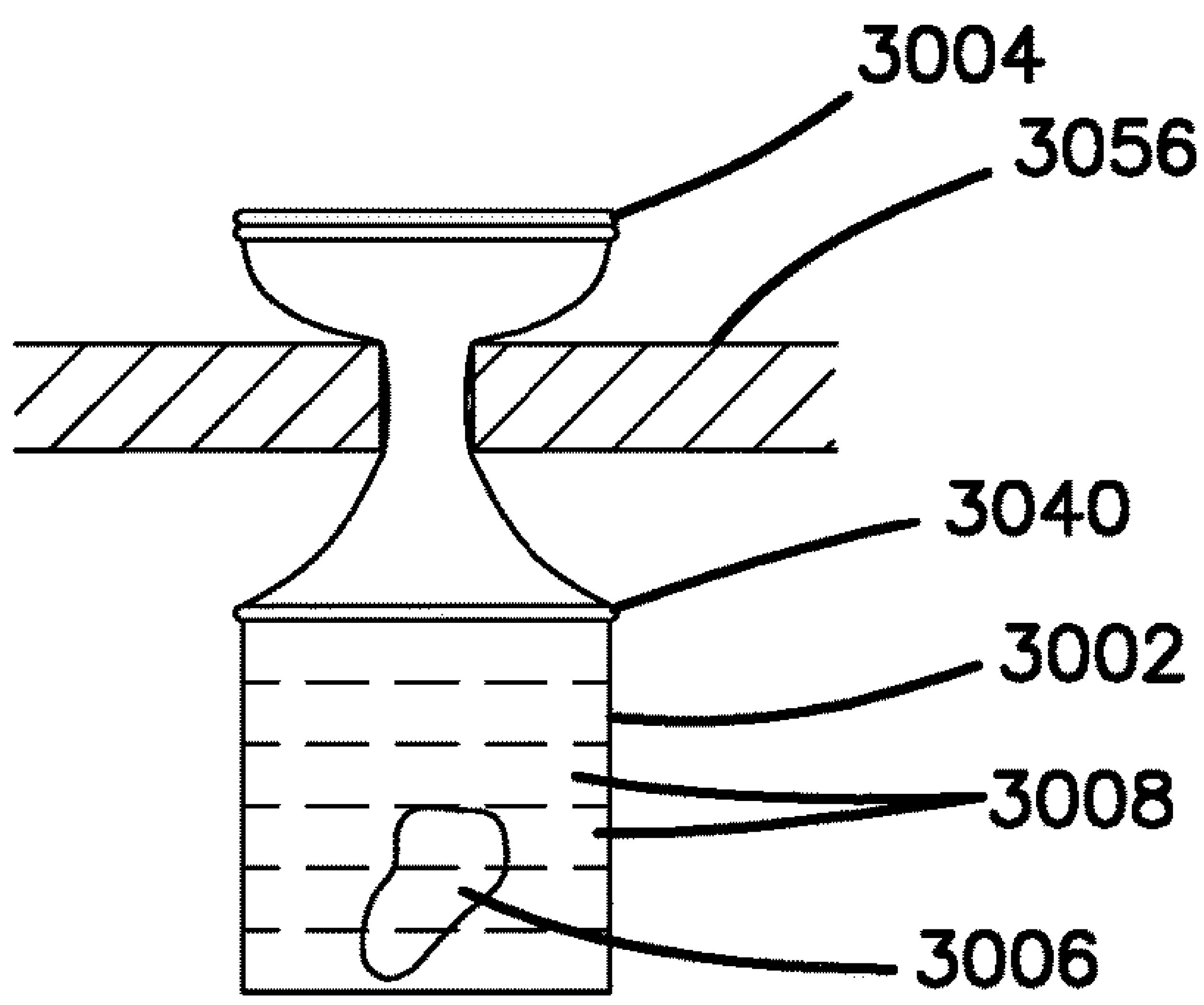


FIG. 143A

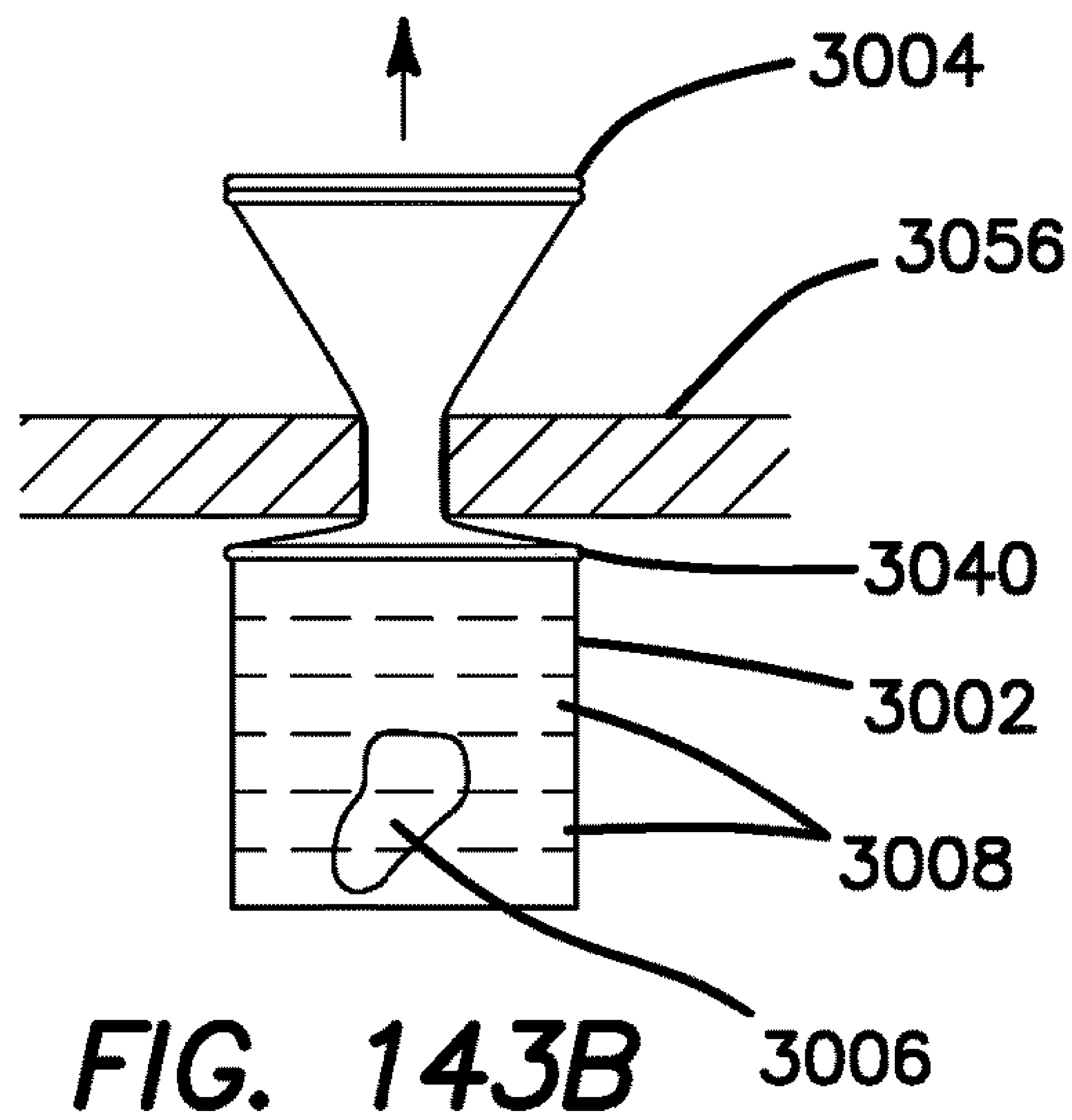


FIG. 143B

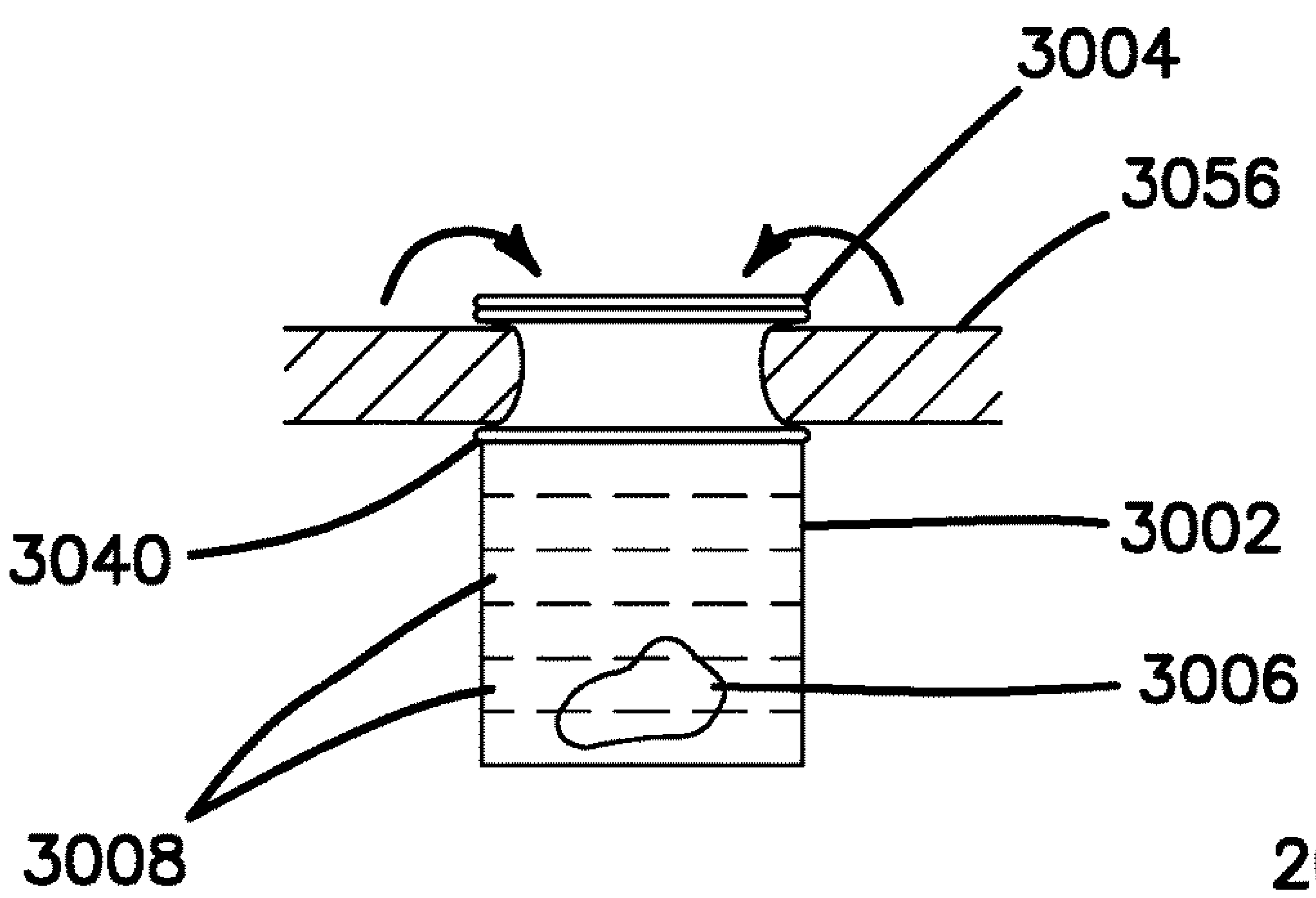


FIG. 143C

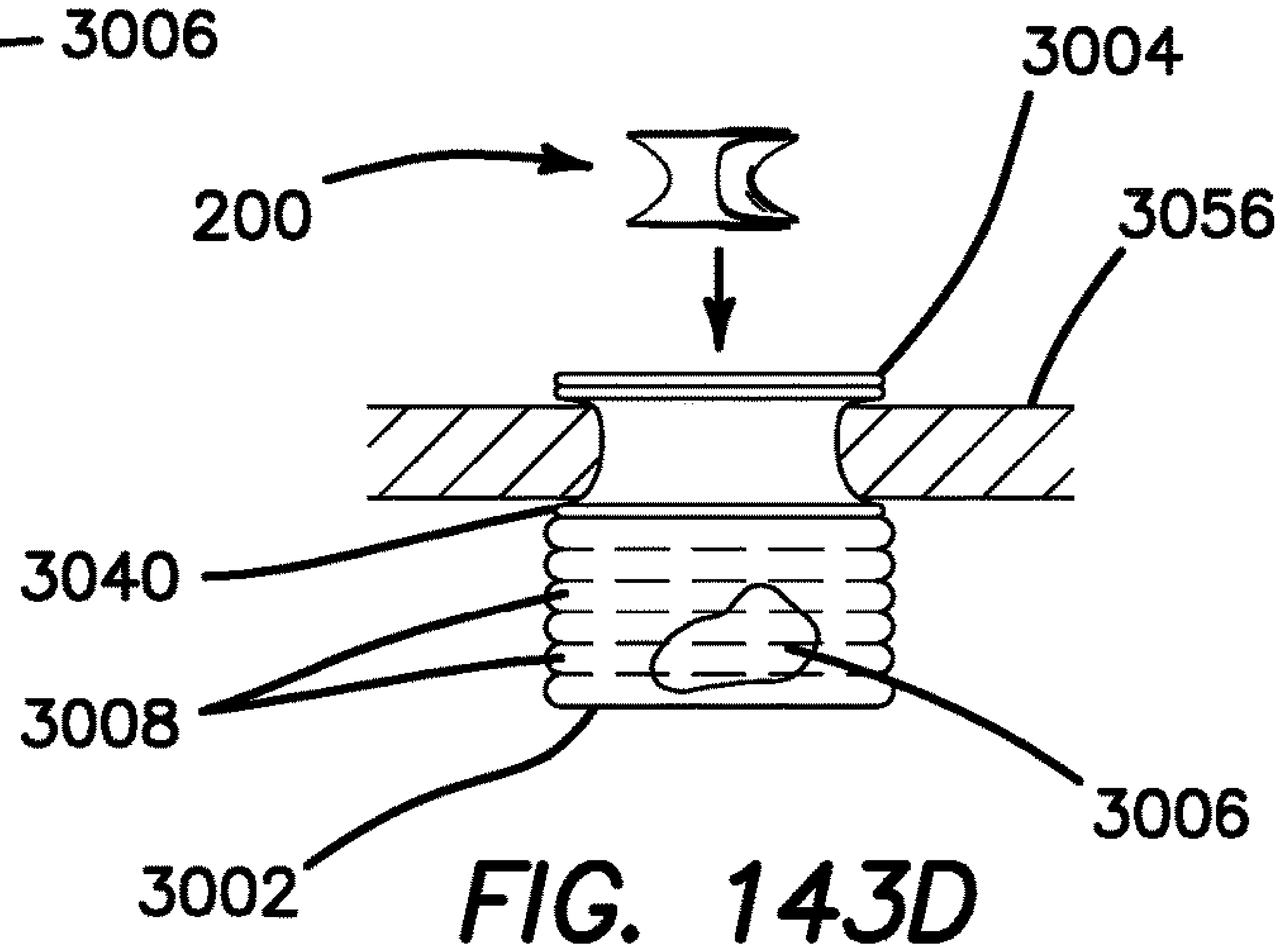


FIG. 143D

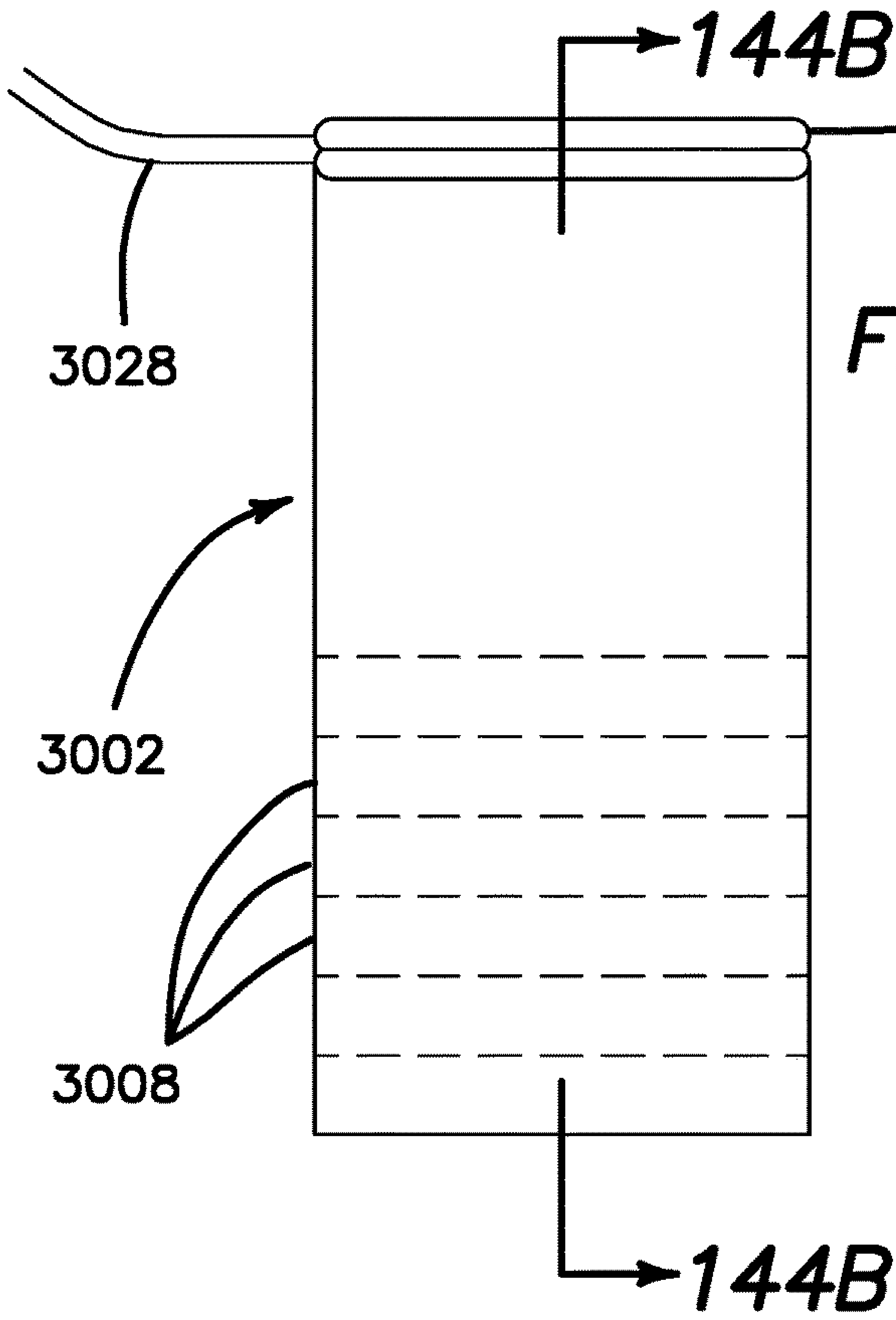


FIG. 144A

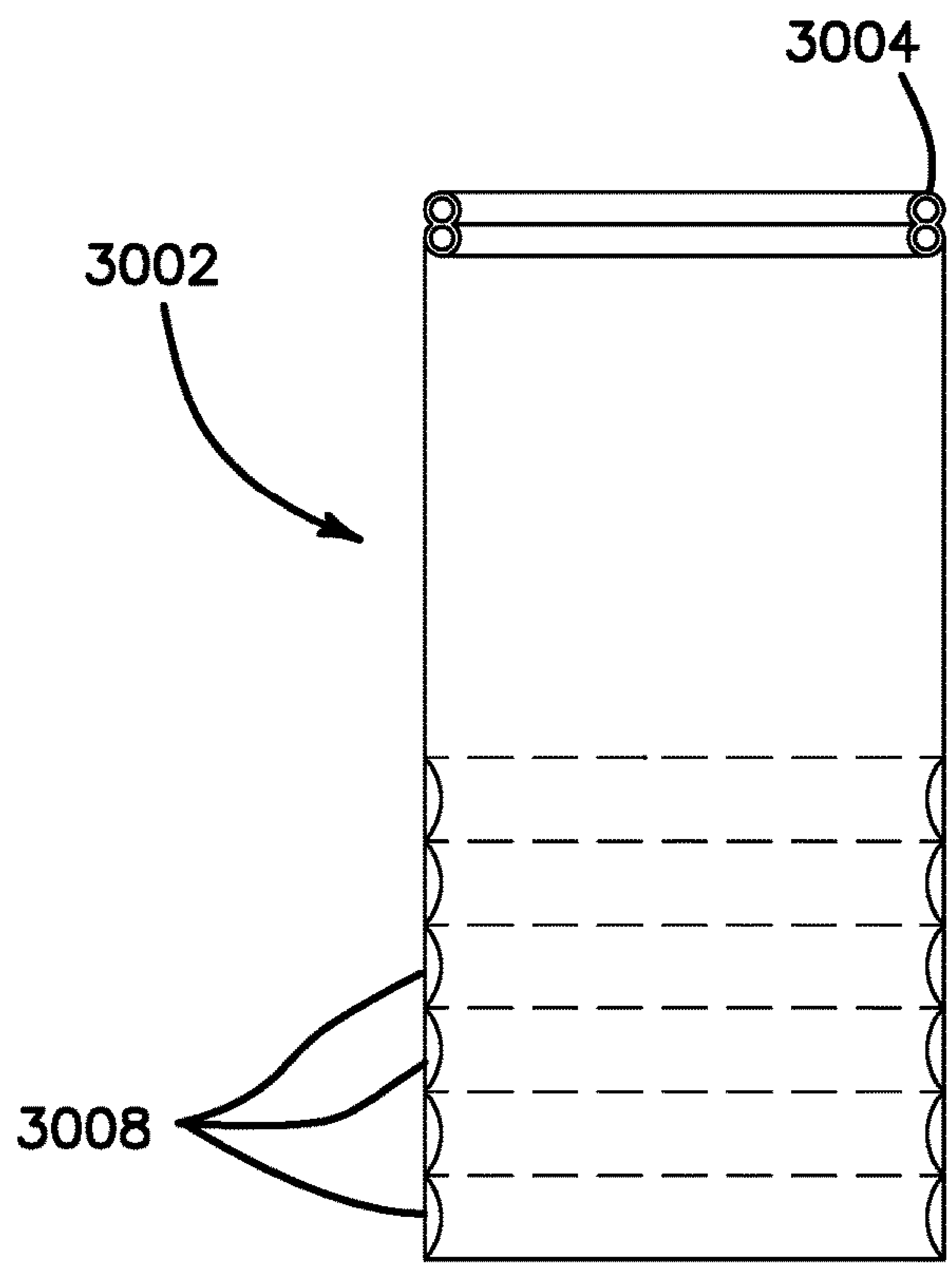
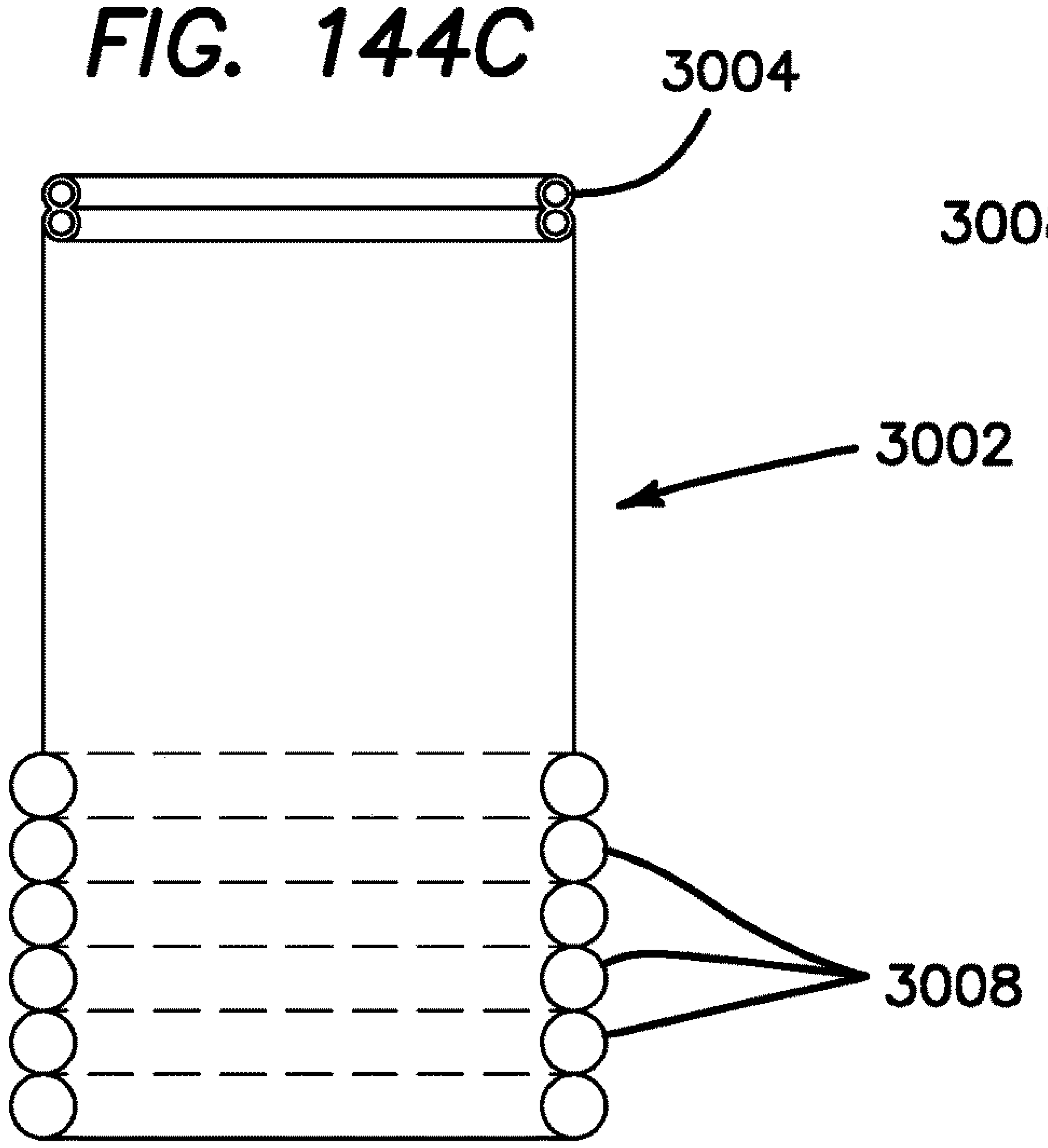


FIG. 144B

FIG. 144C



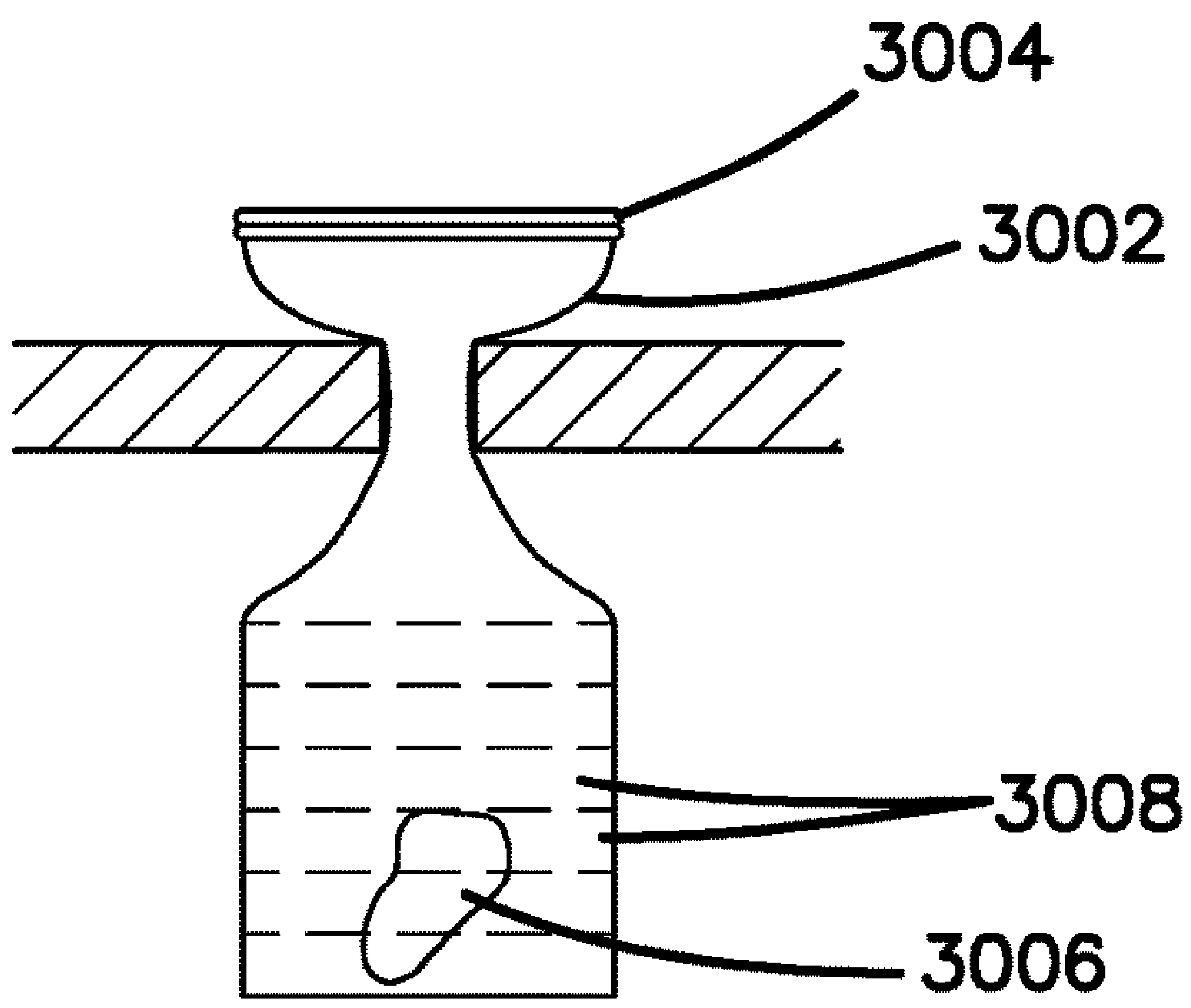


FIG. 145A

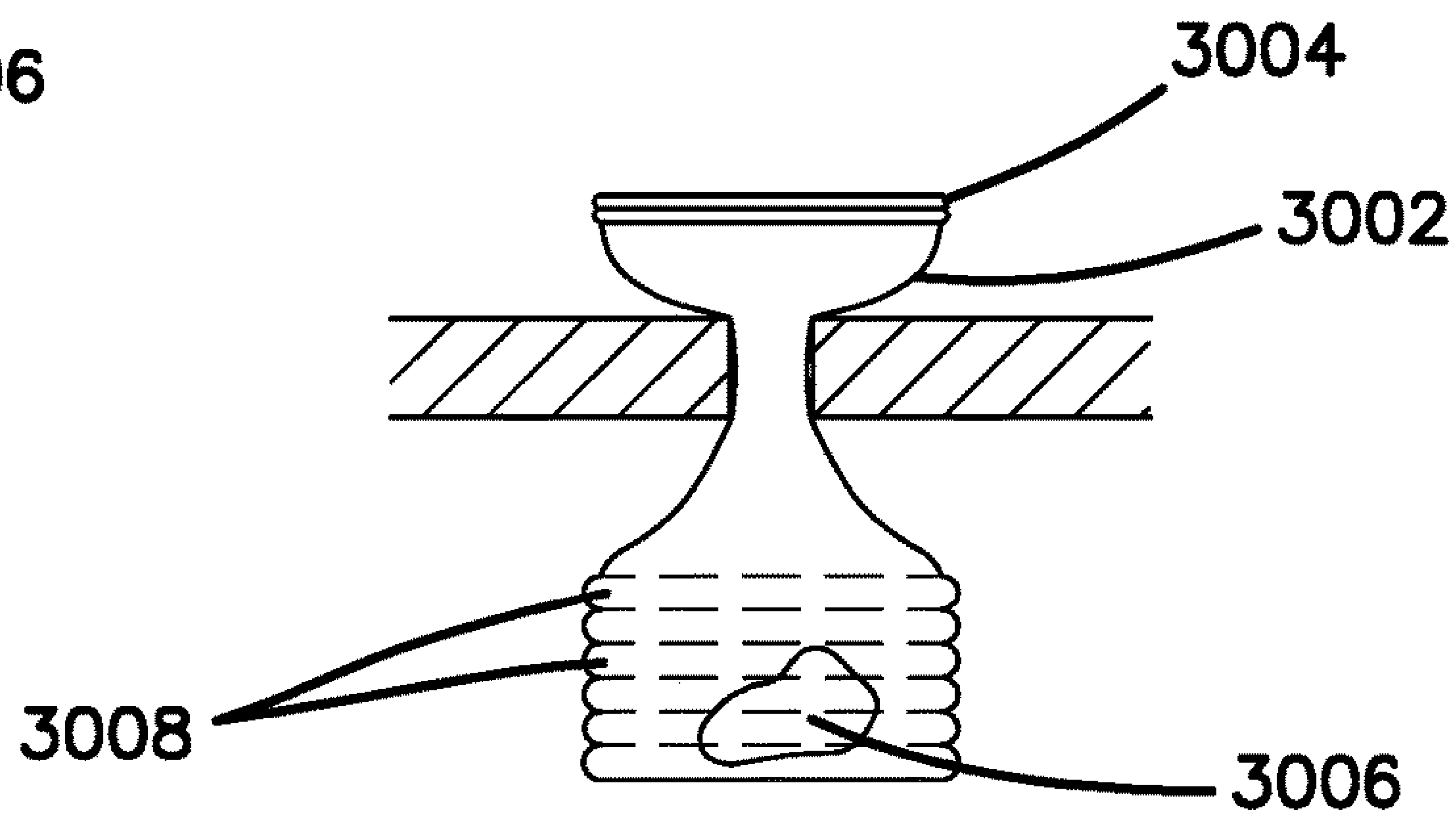


FIG. 145B

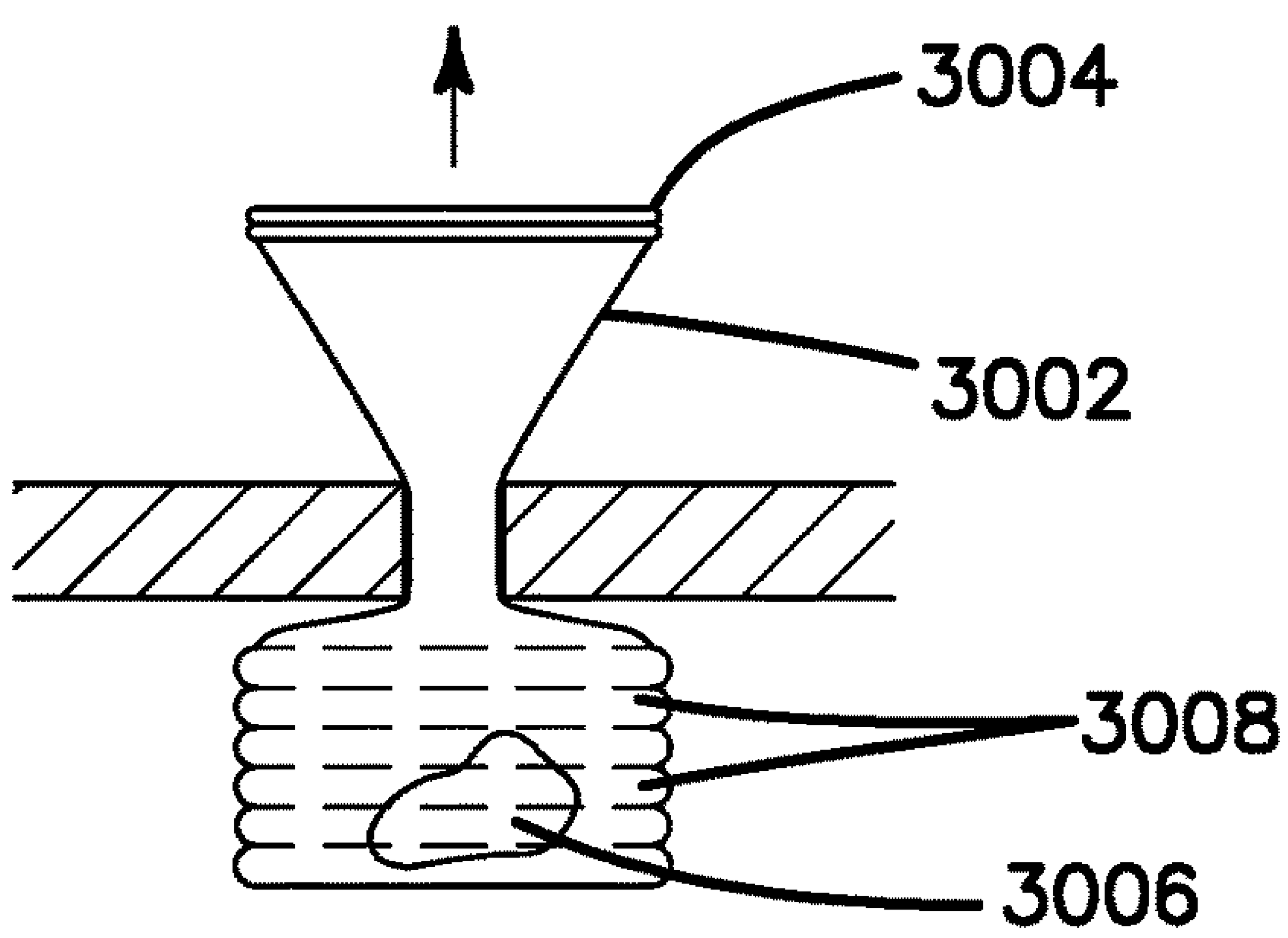


FIG. 145C

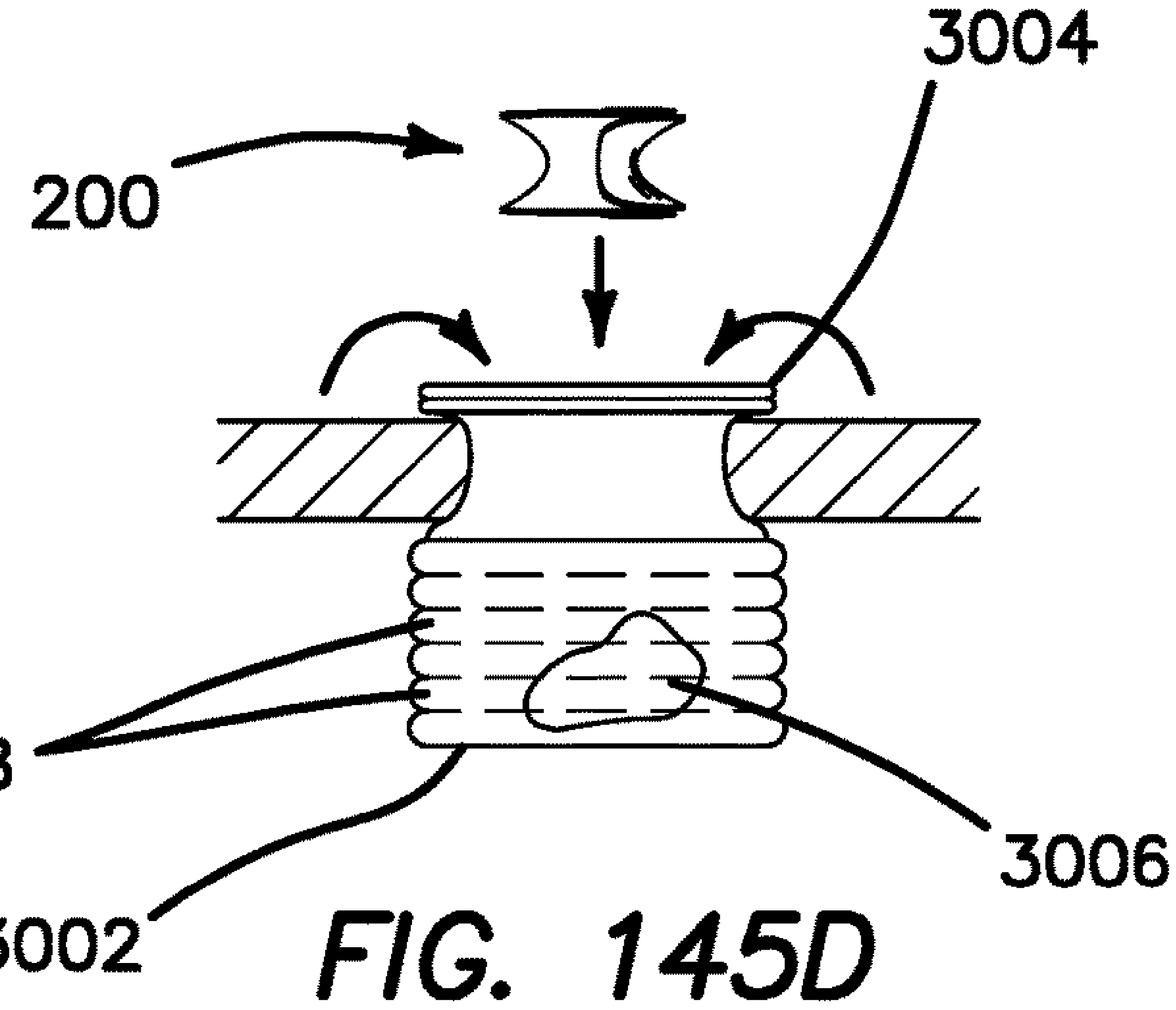


FIG. 145D

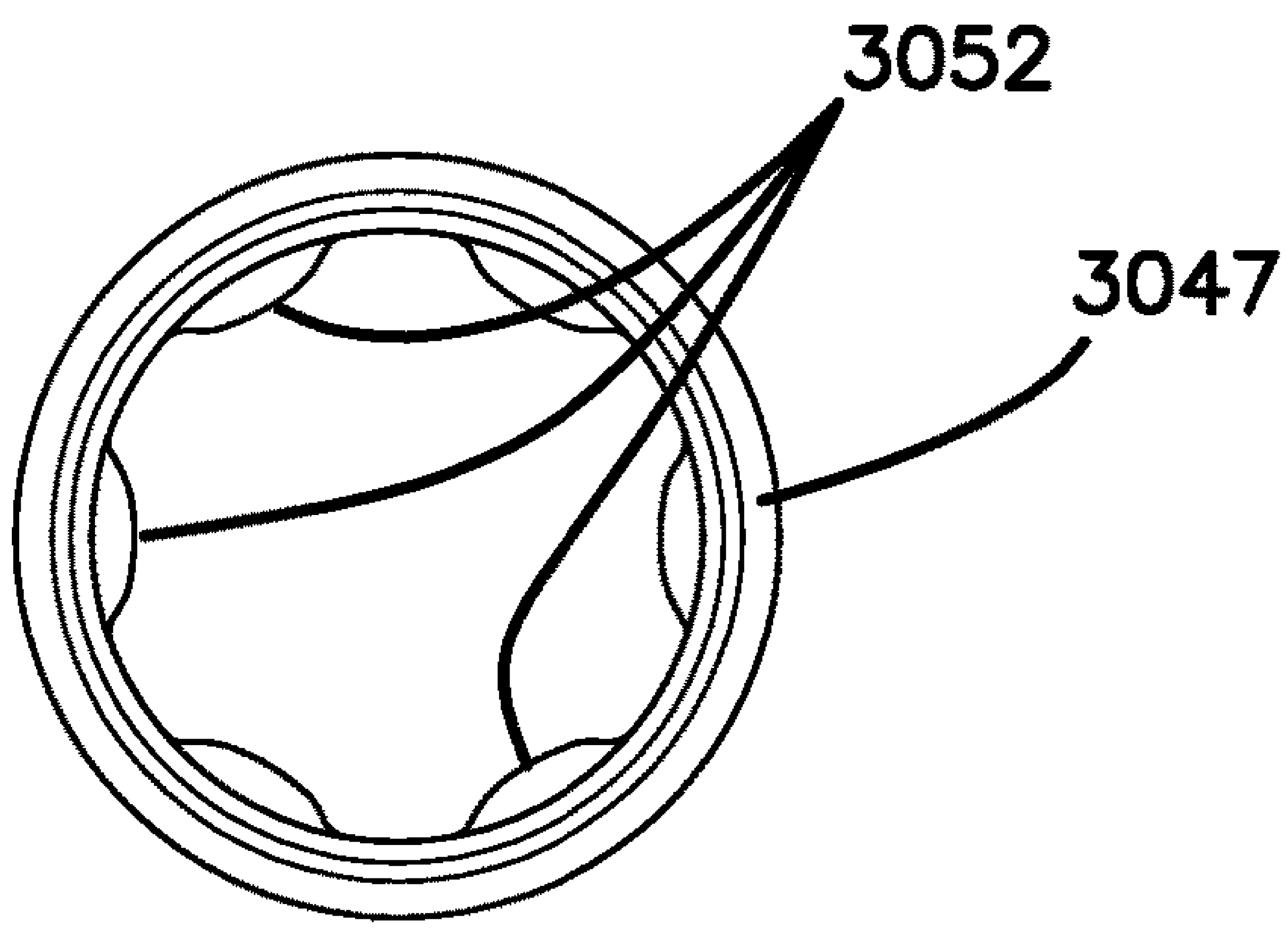


FIG. 147A

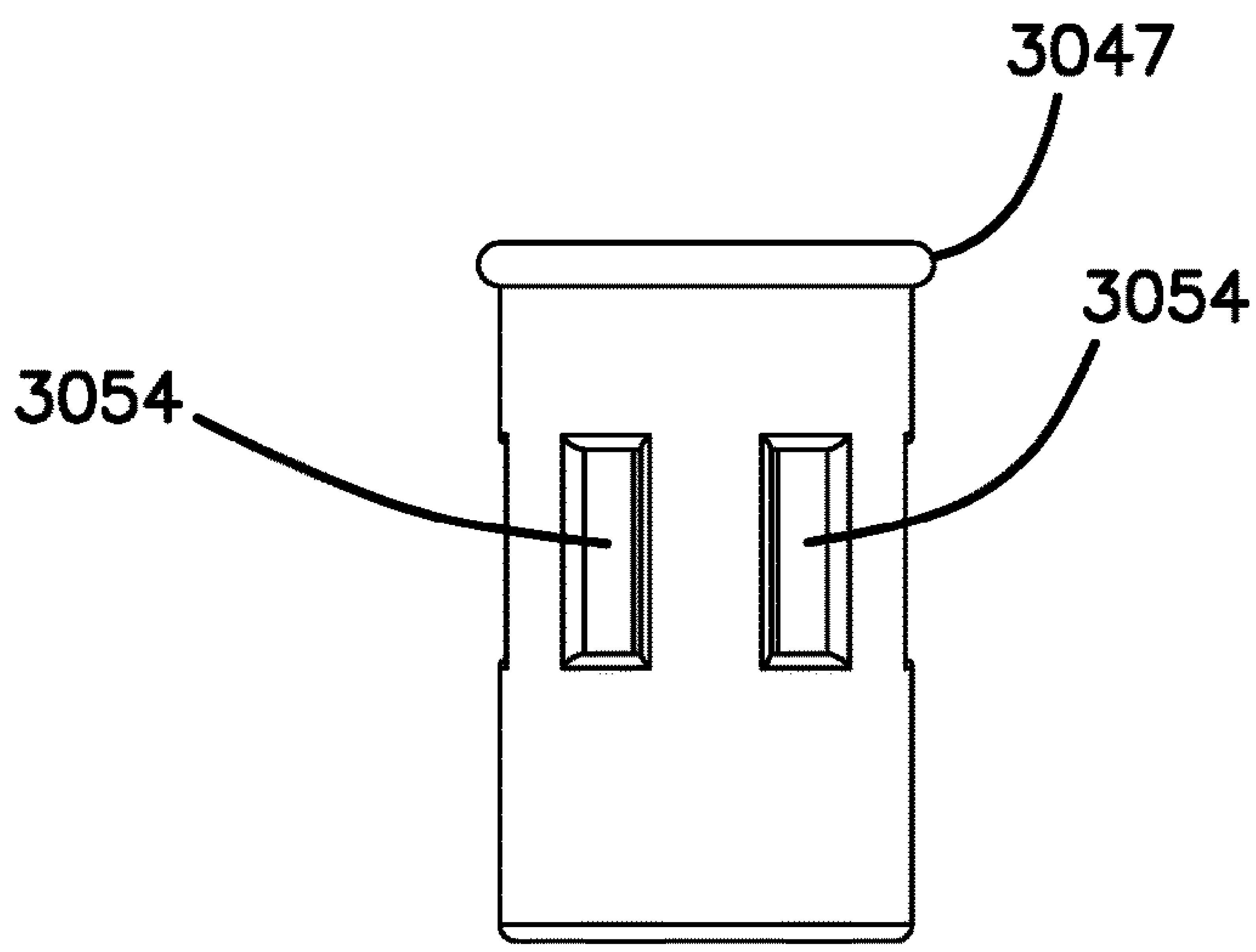


FIG. 147B

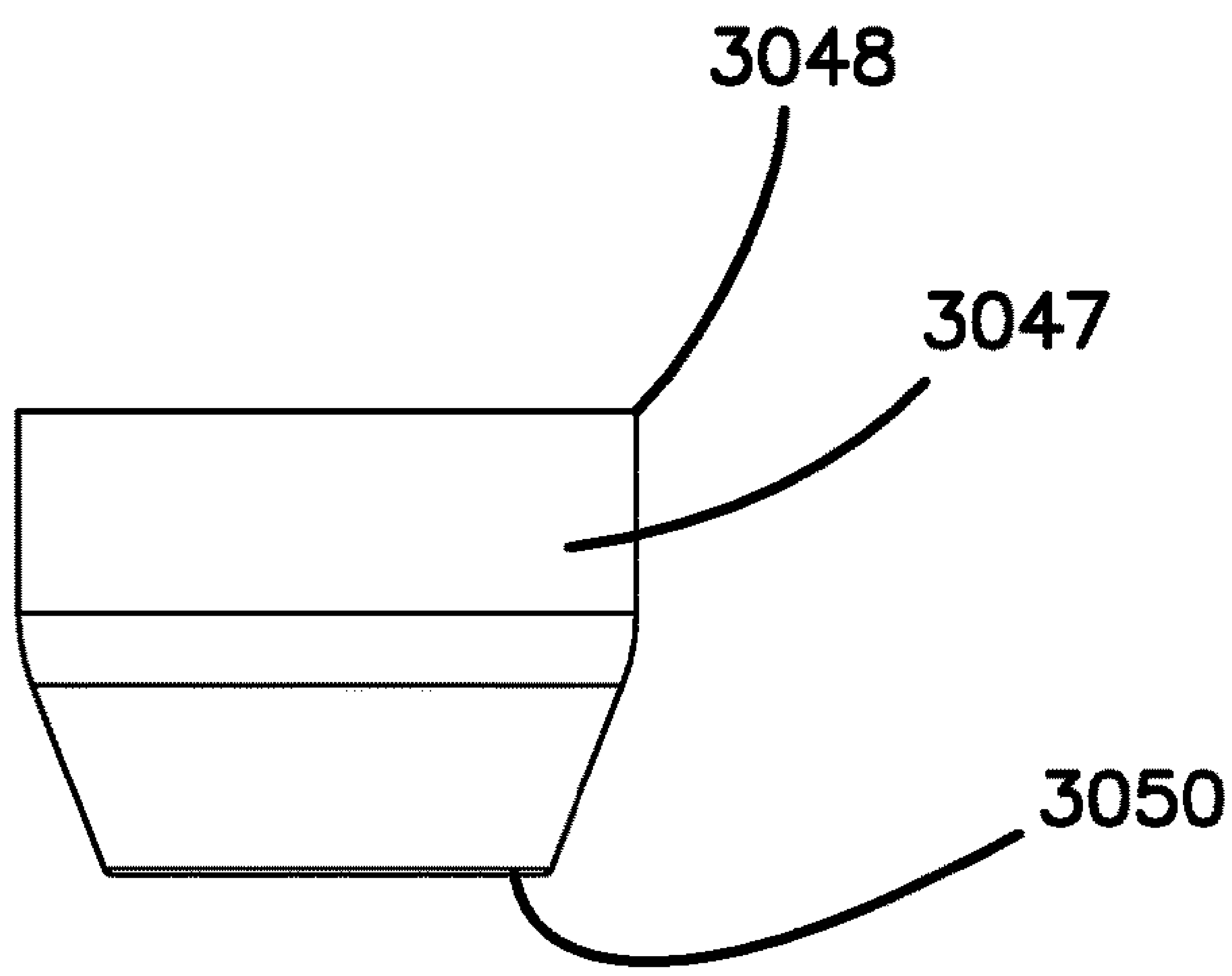


FIG. 148A

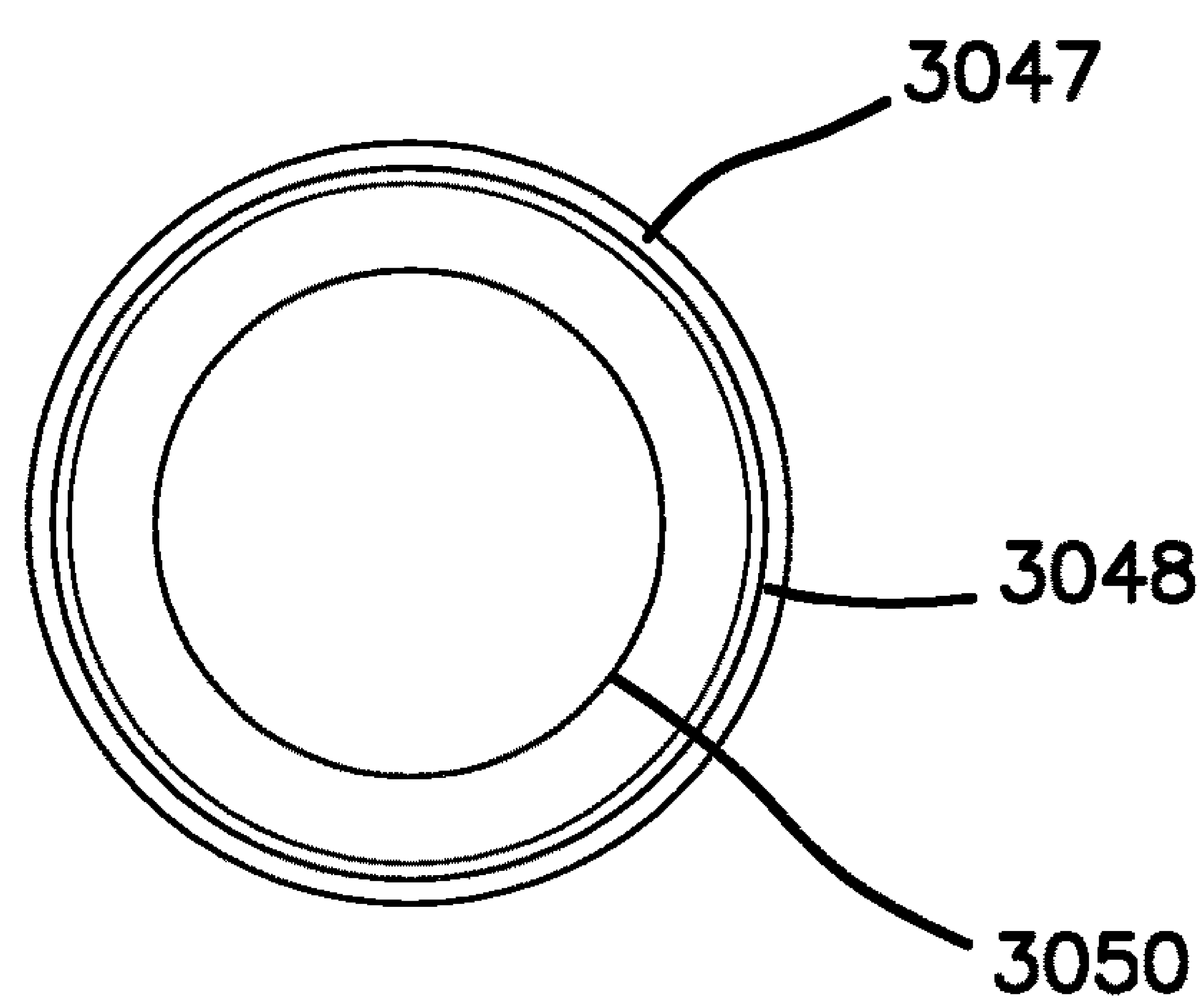


FIG. 148B

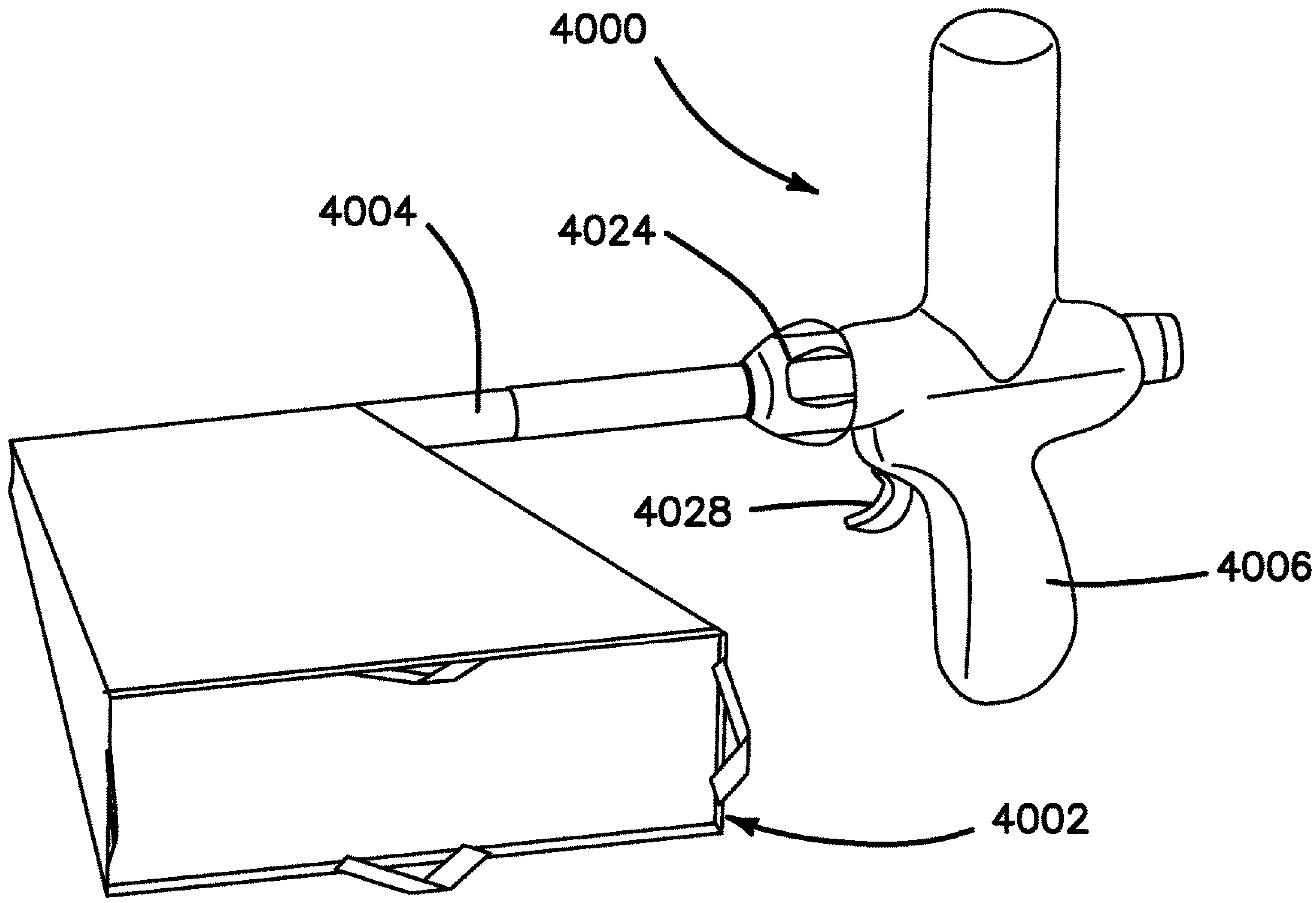


FIG. 149

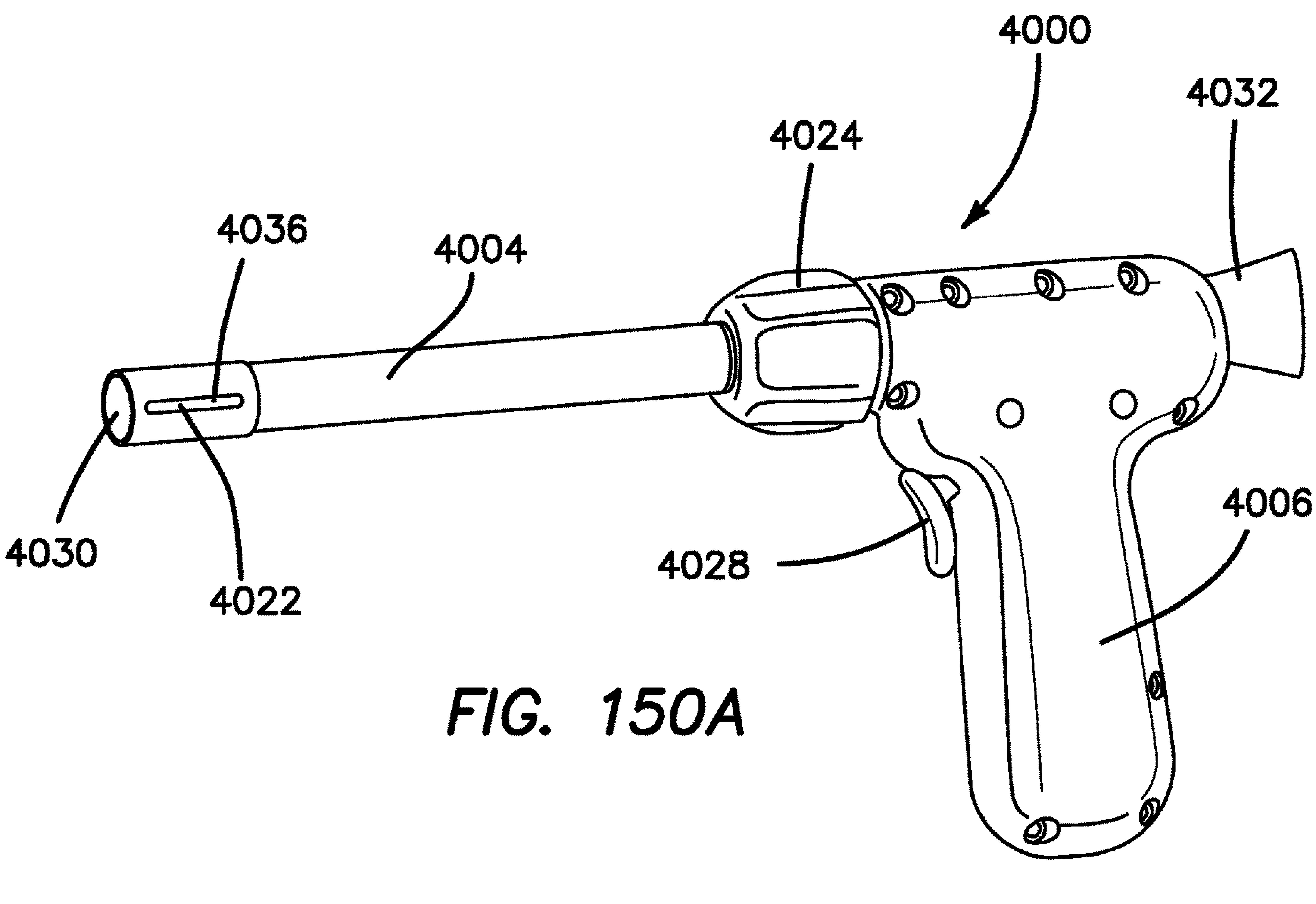


FIG. 150A

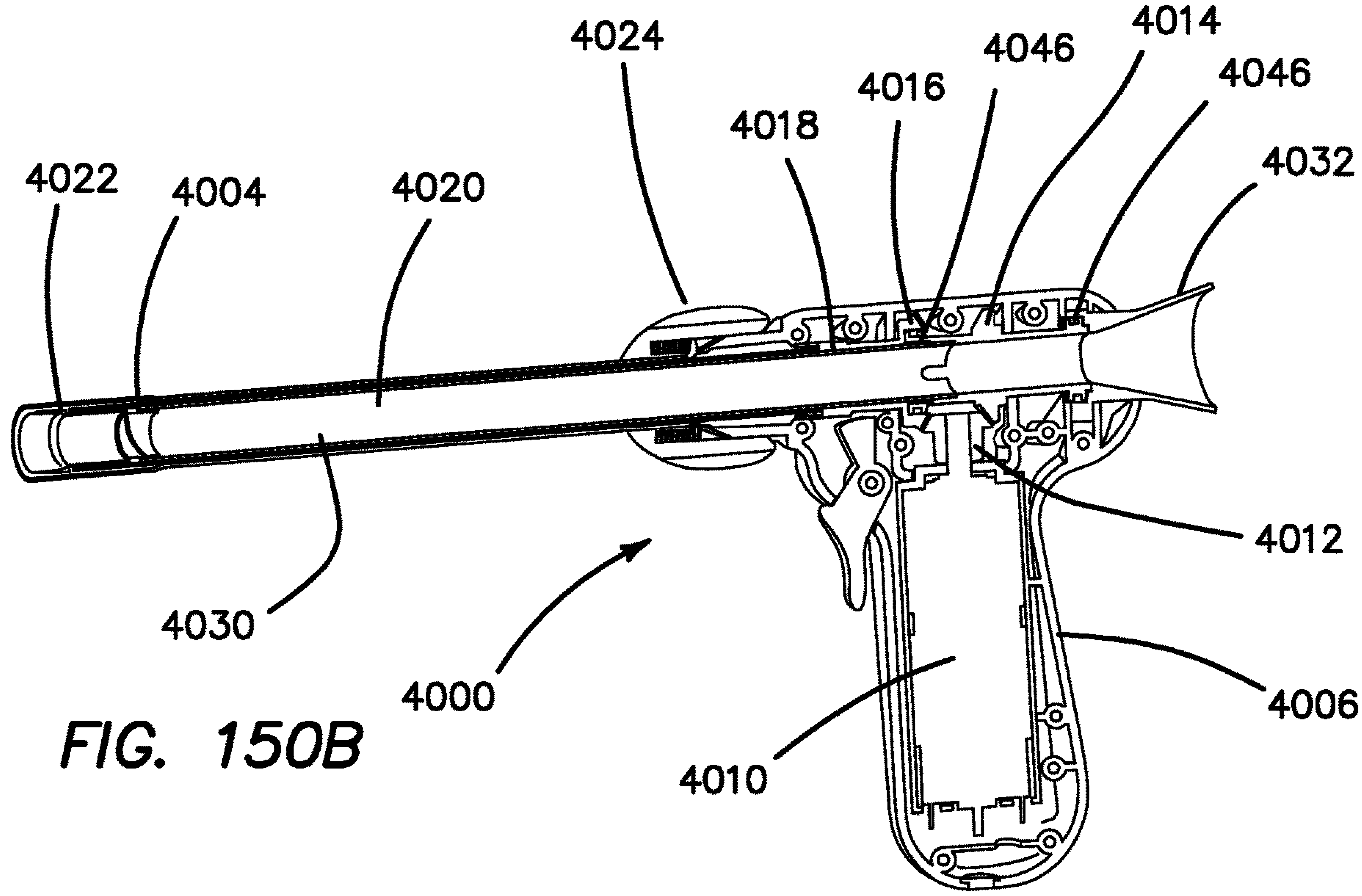


FIG. 150B

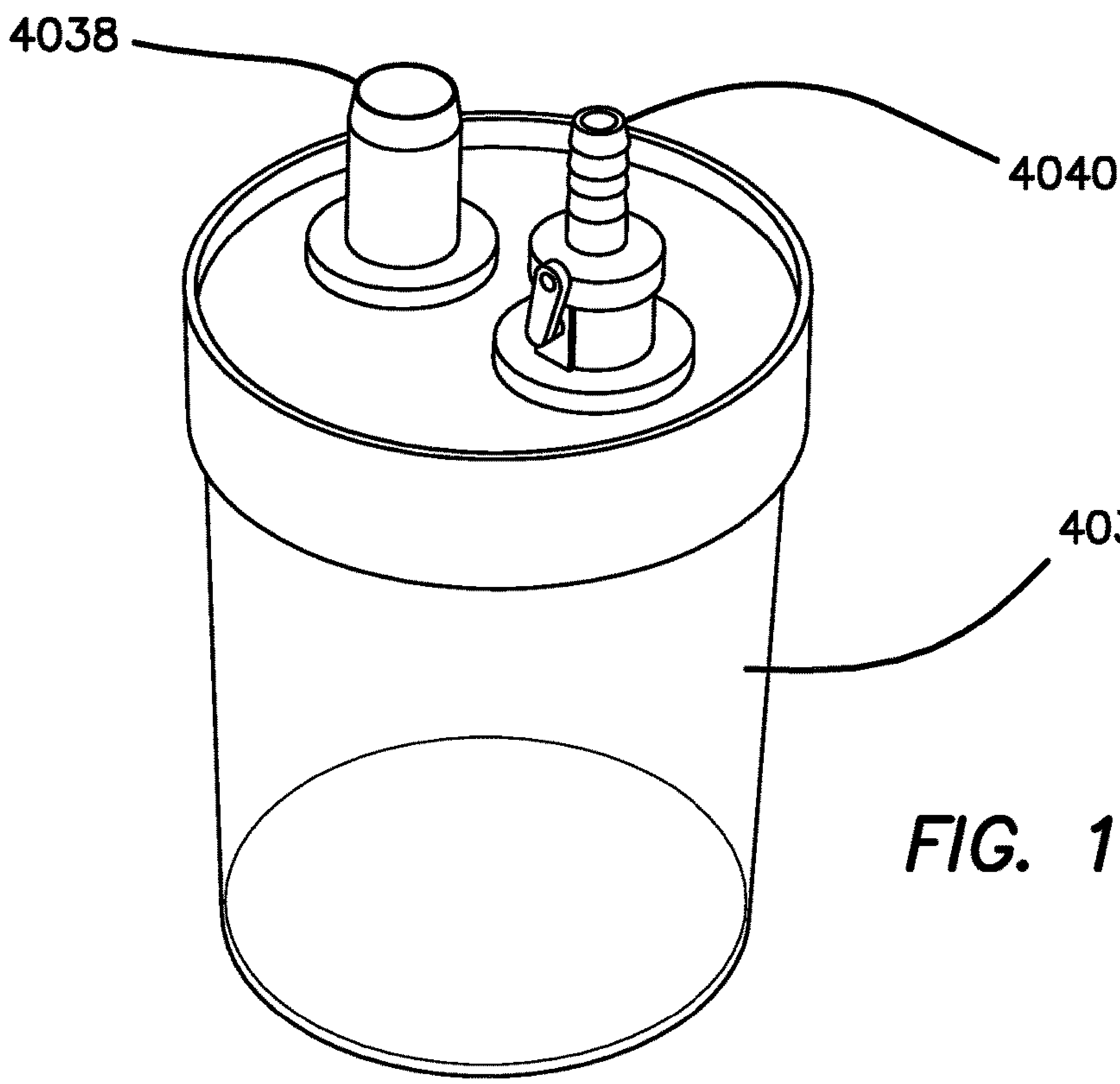


FIG. 151

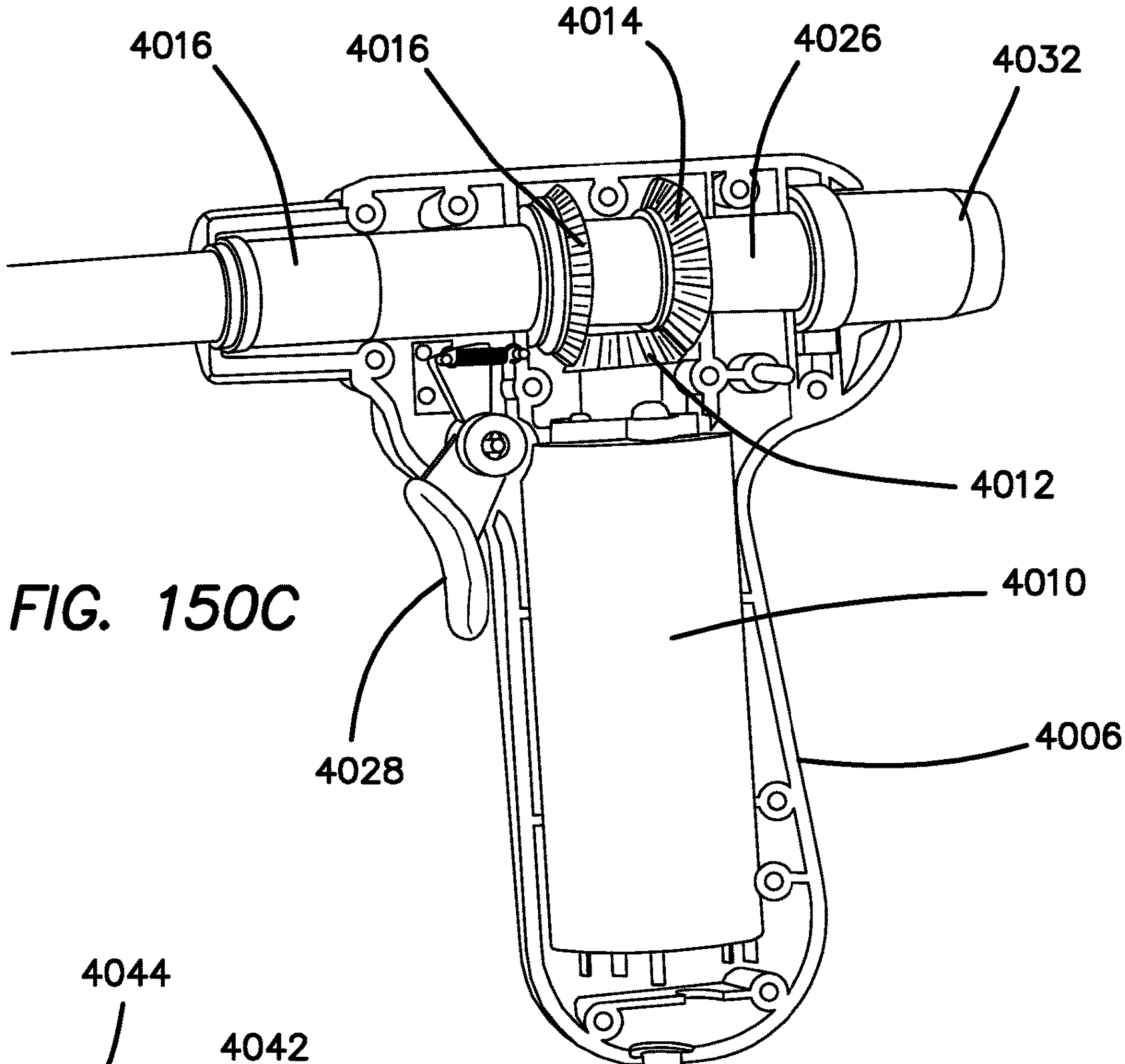


FIG. 150C

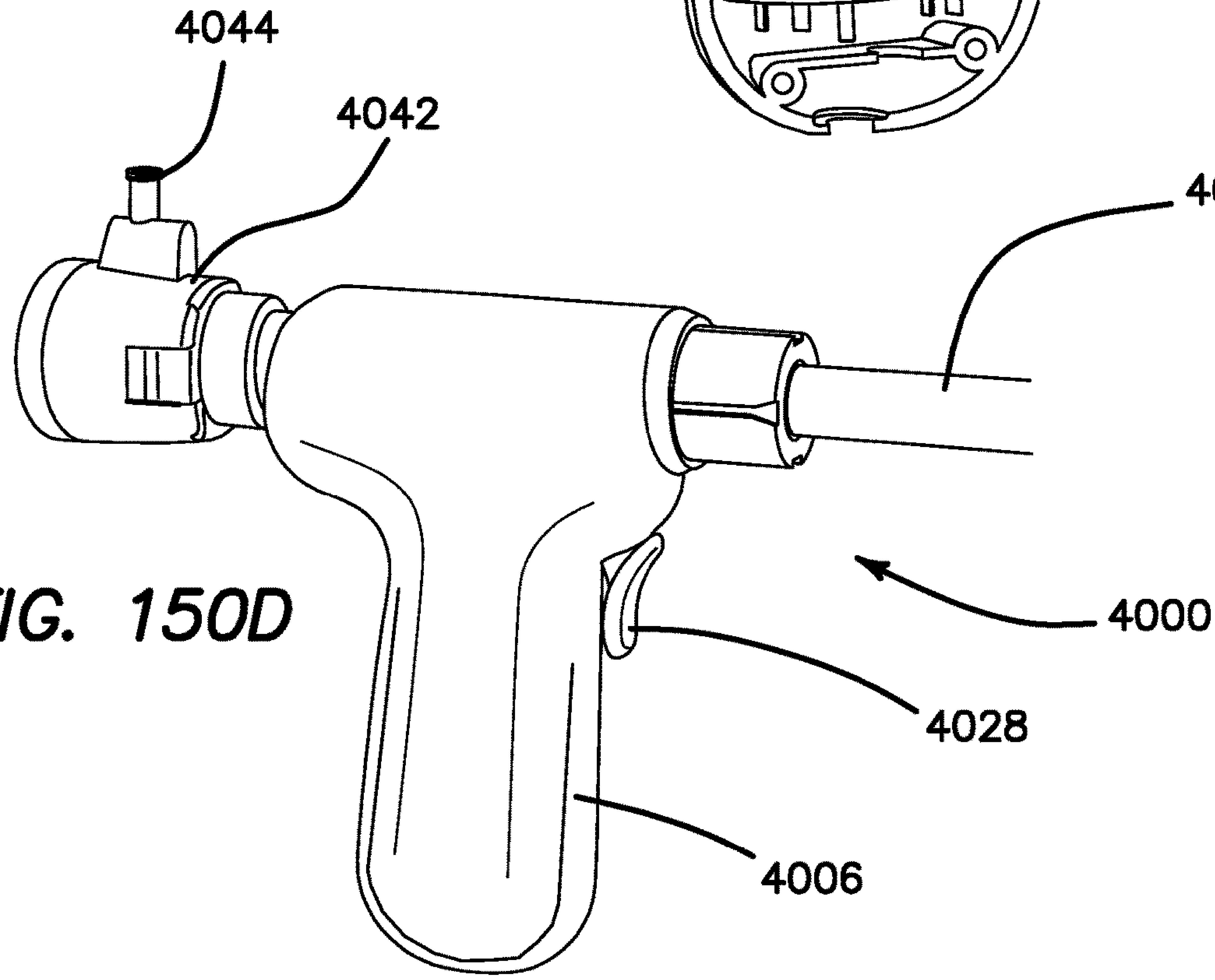


FIG. 150D

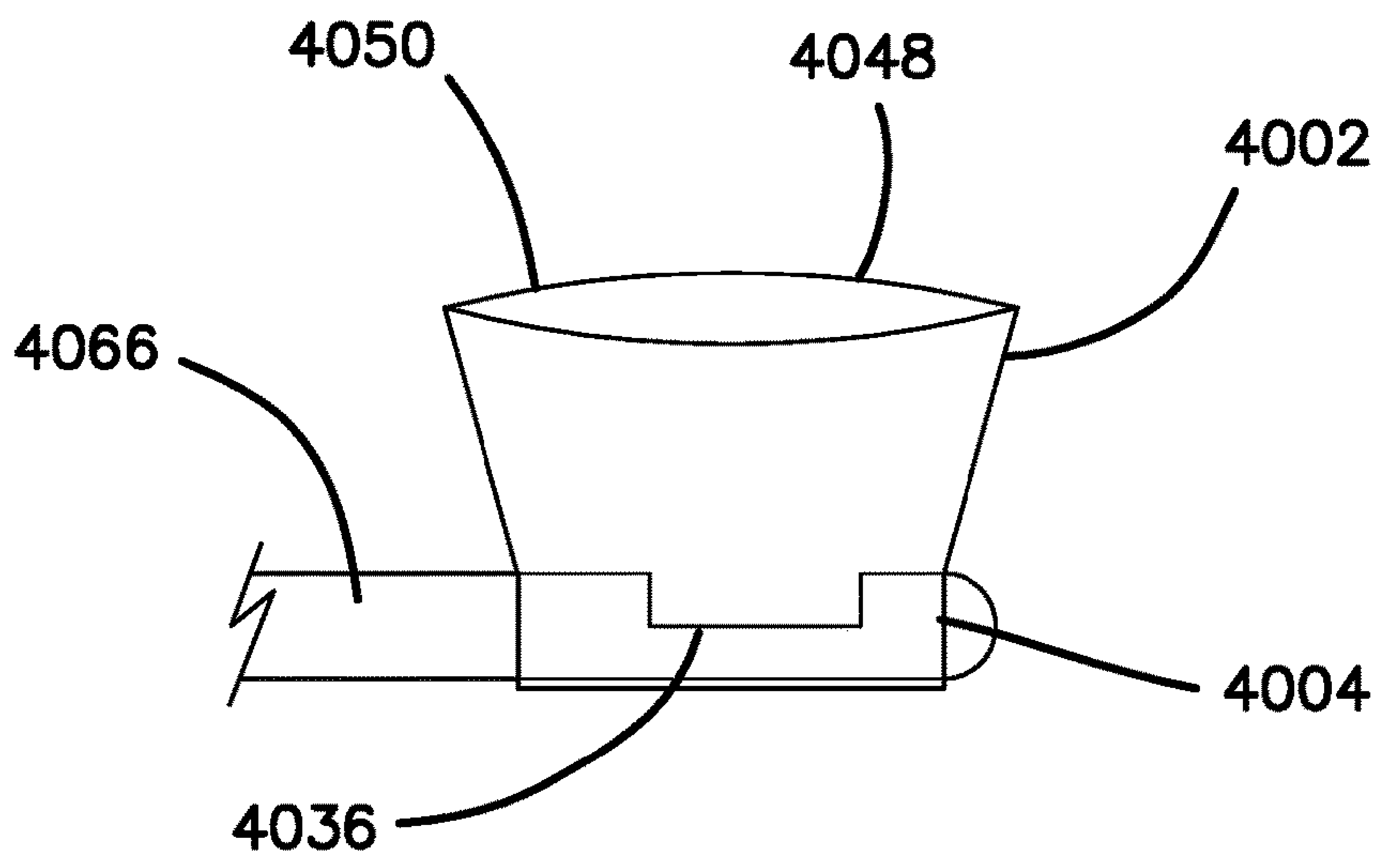


FIG. 152

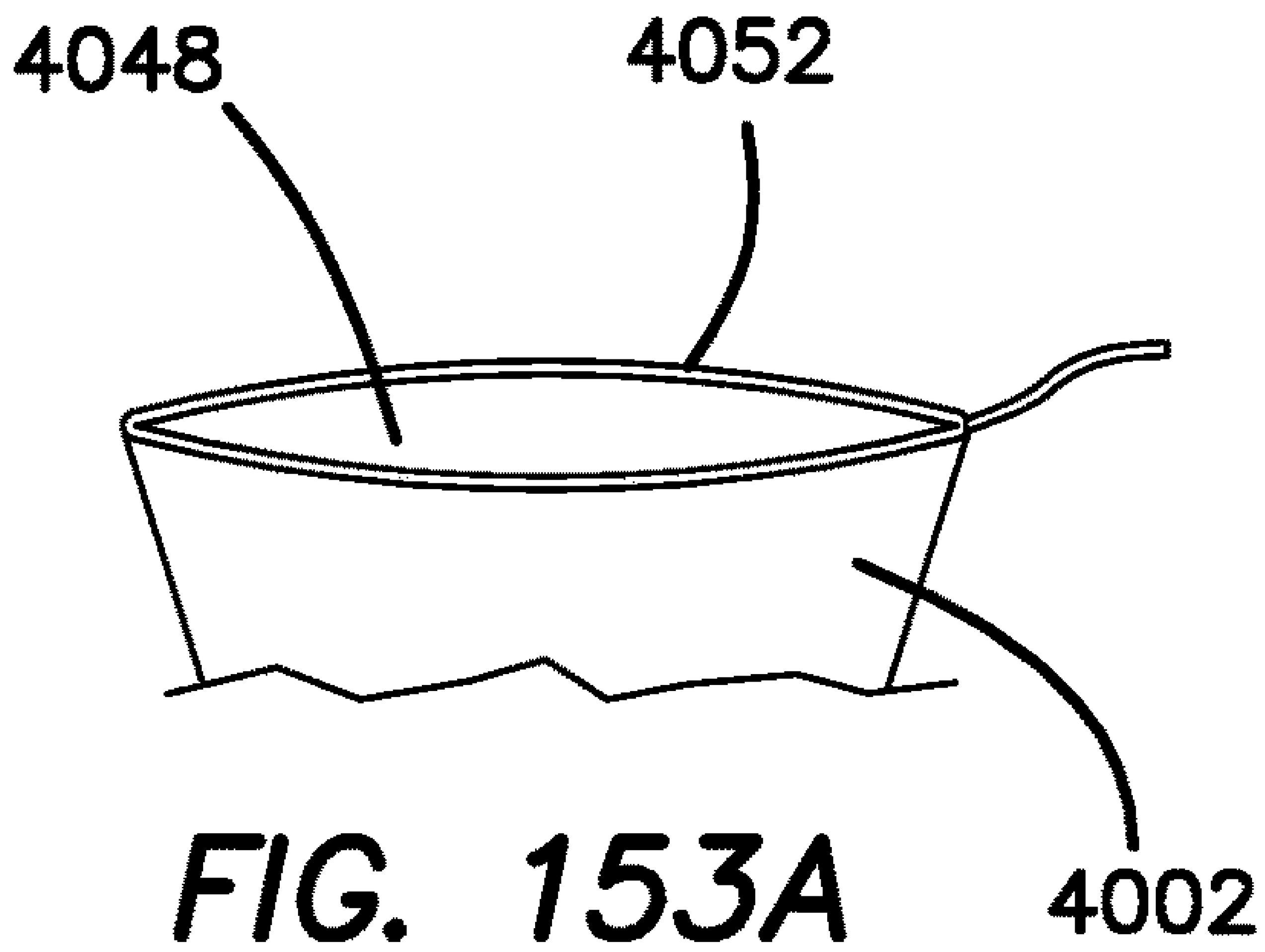


FIG. 153A

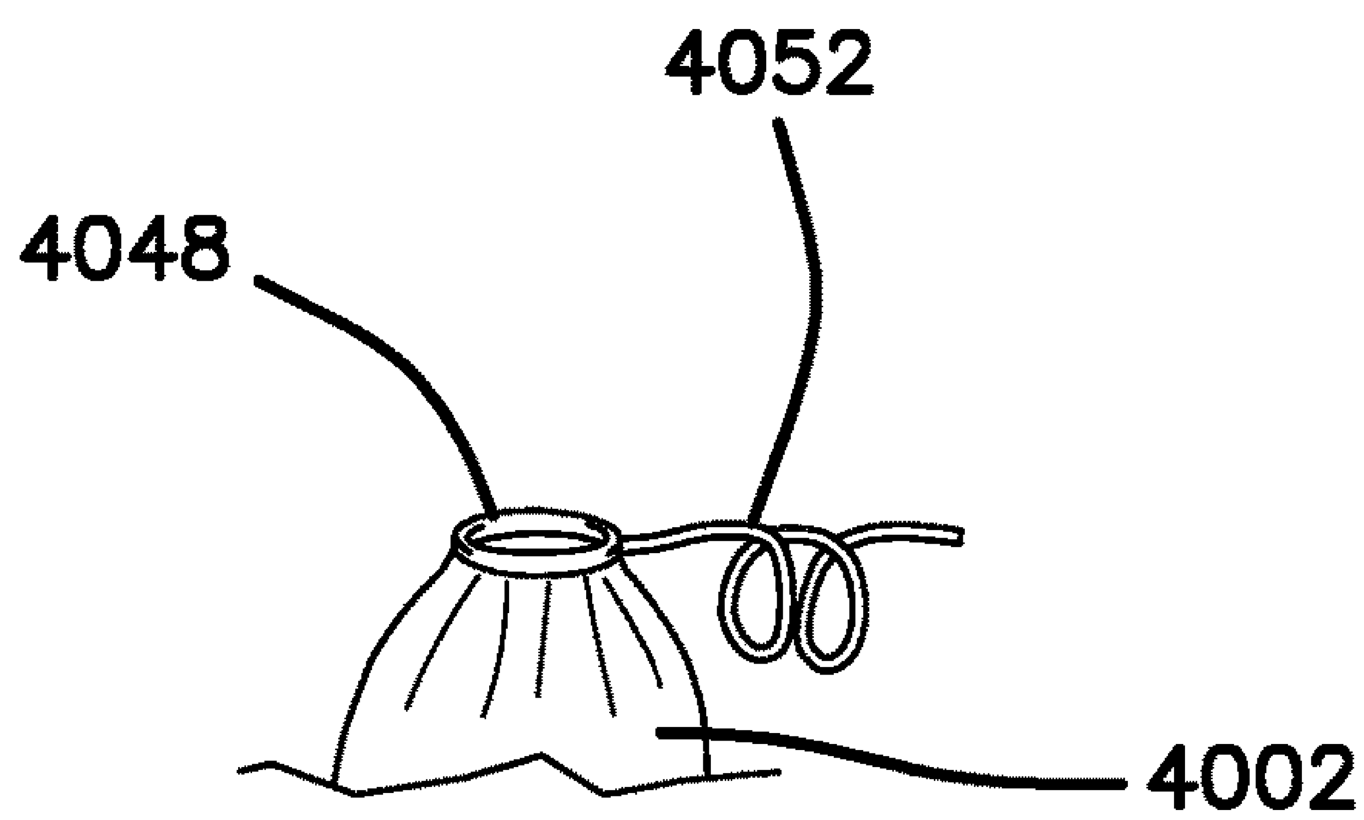


FIG. 153B

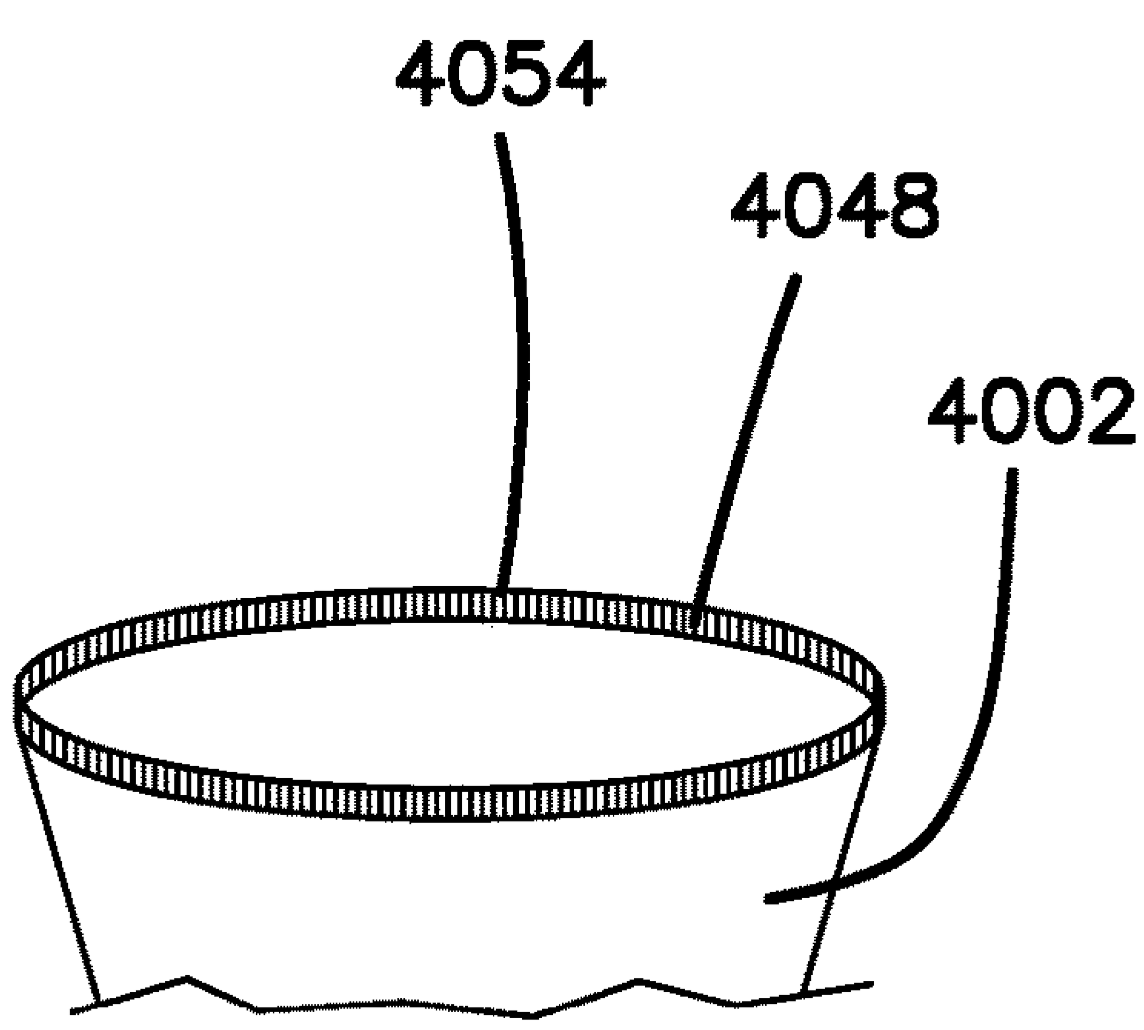


FIG. 154A

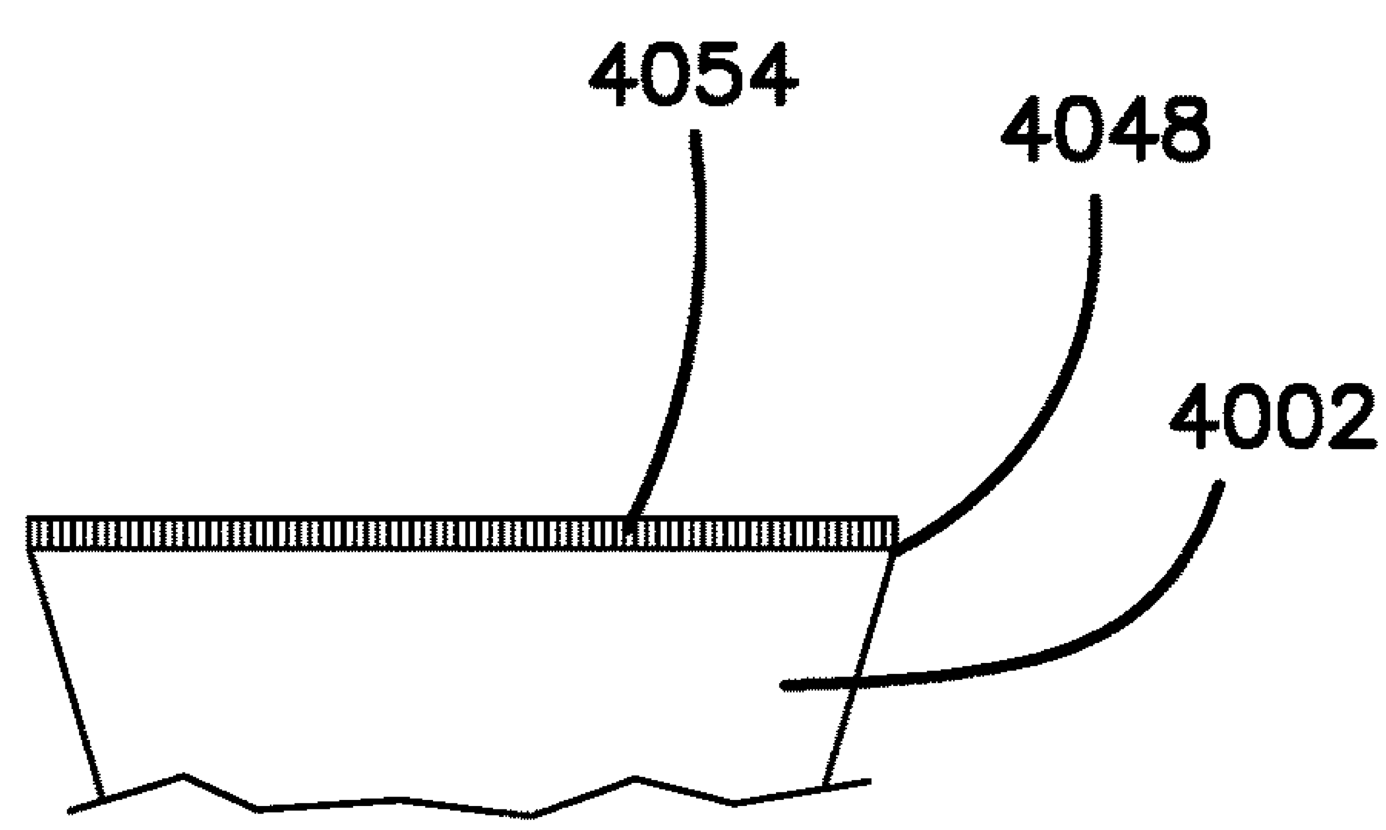


FIG. 154B

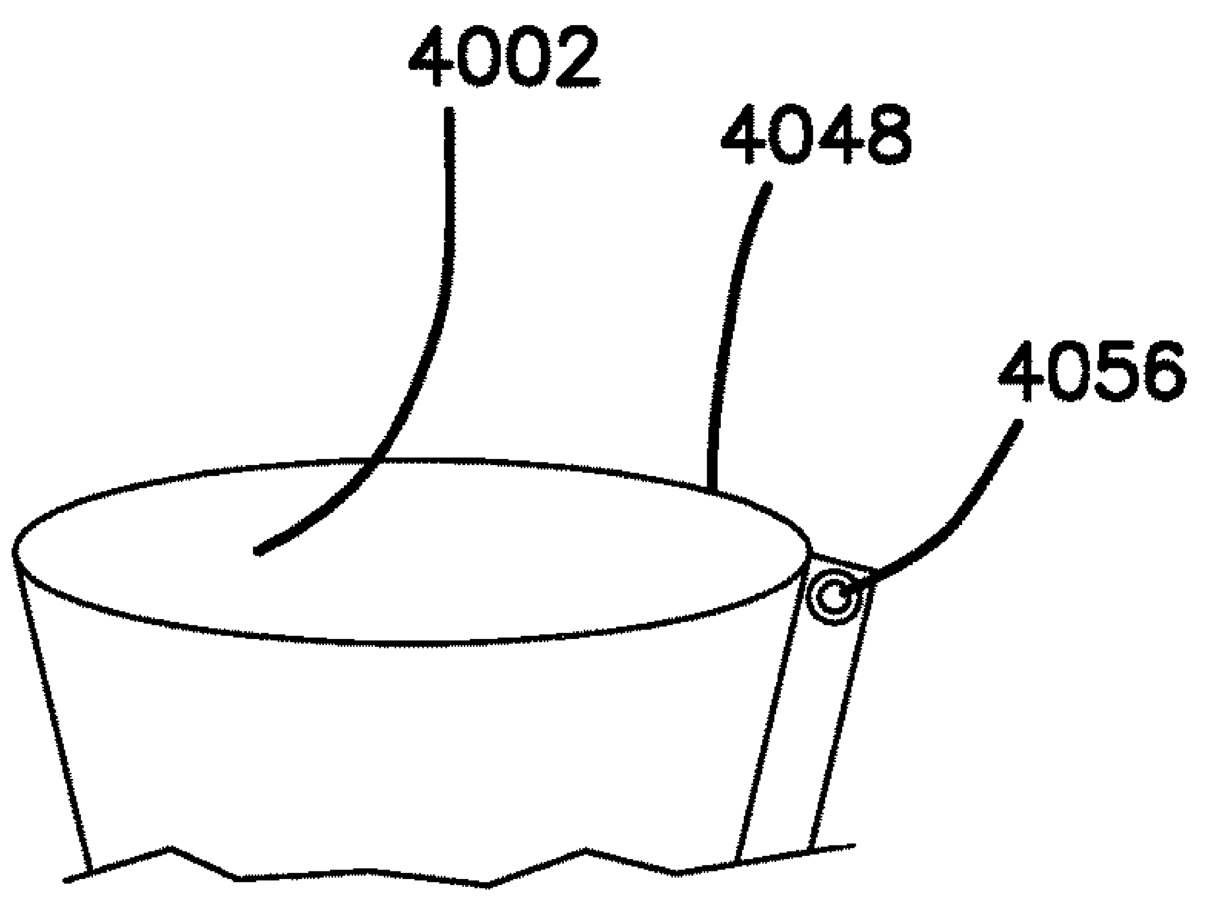


FIG. 155A

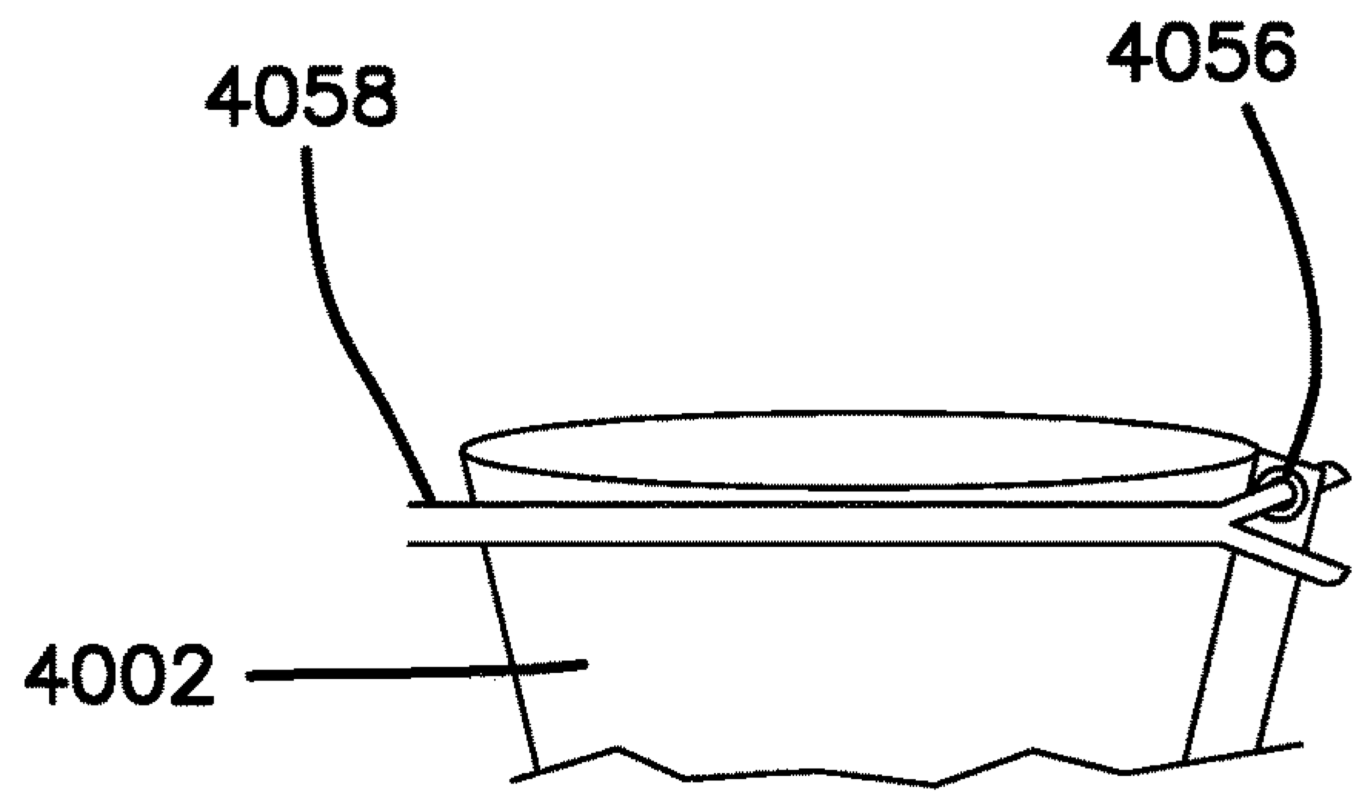


FIG. 155B

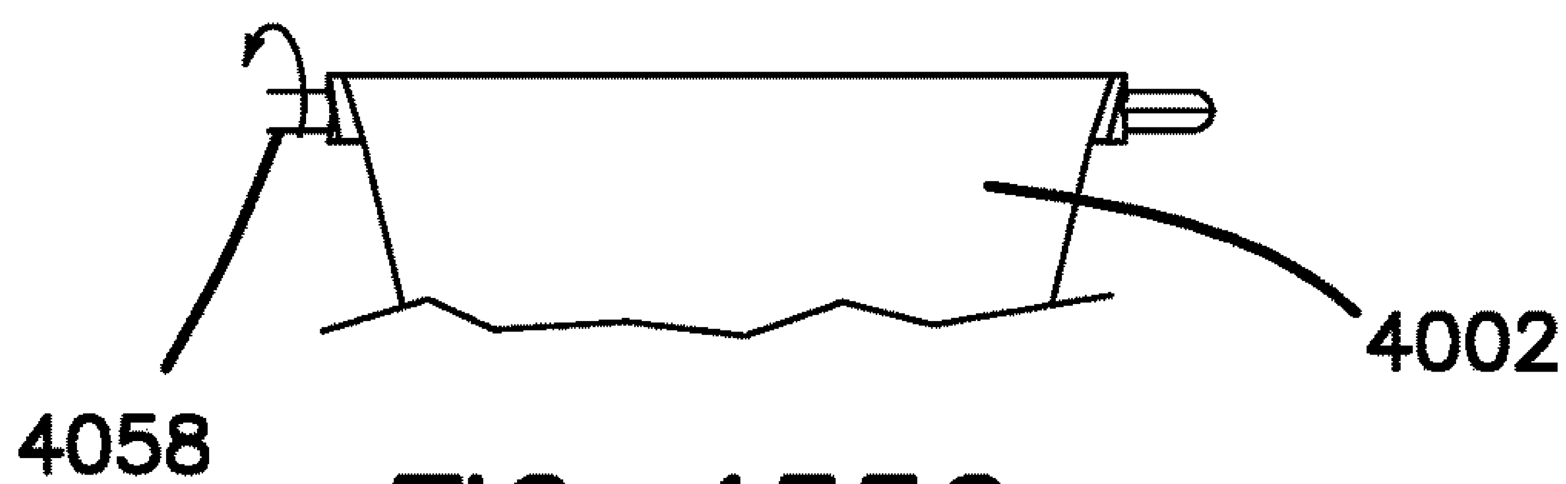


FIG. 155C

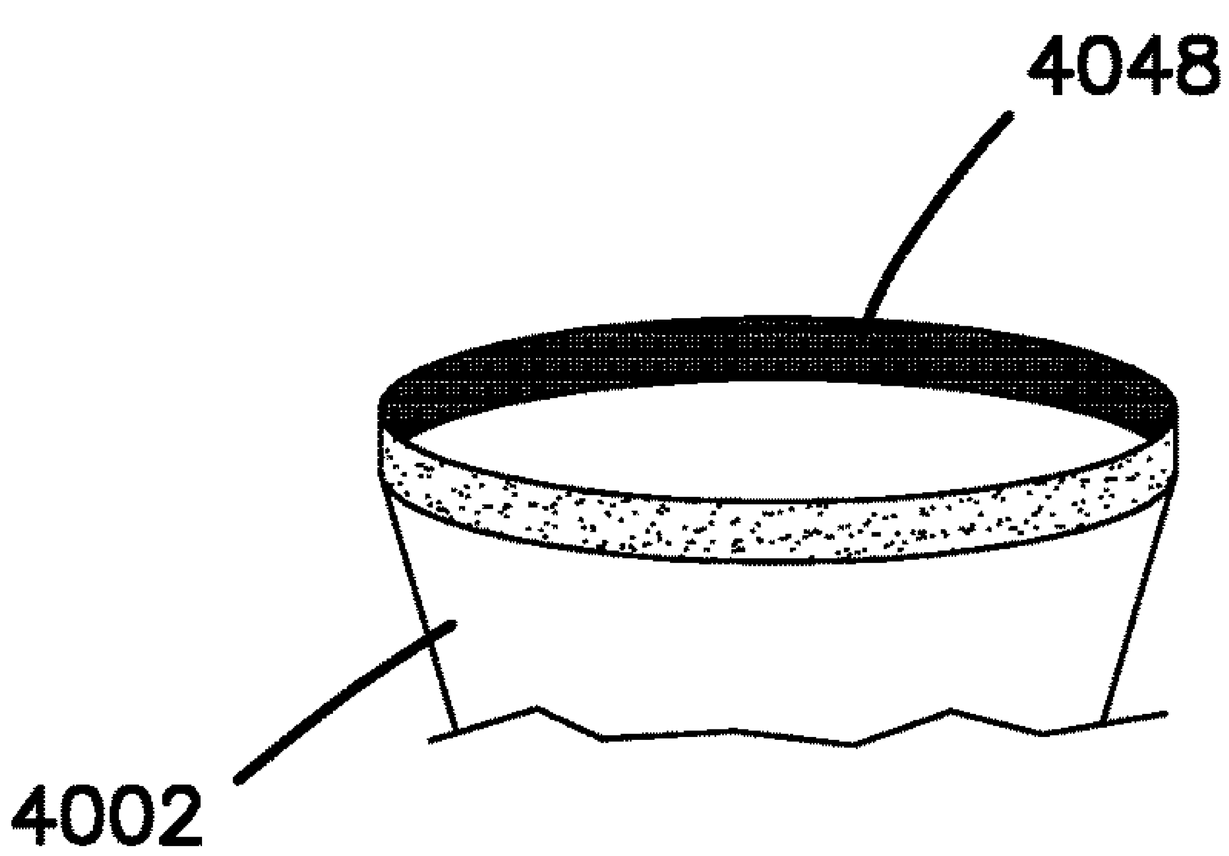


FIG. 156A

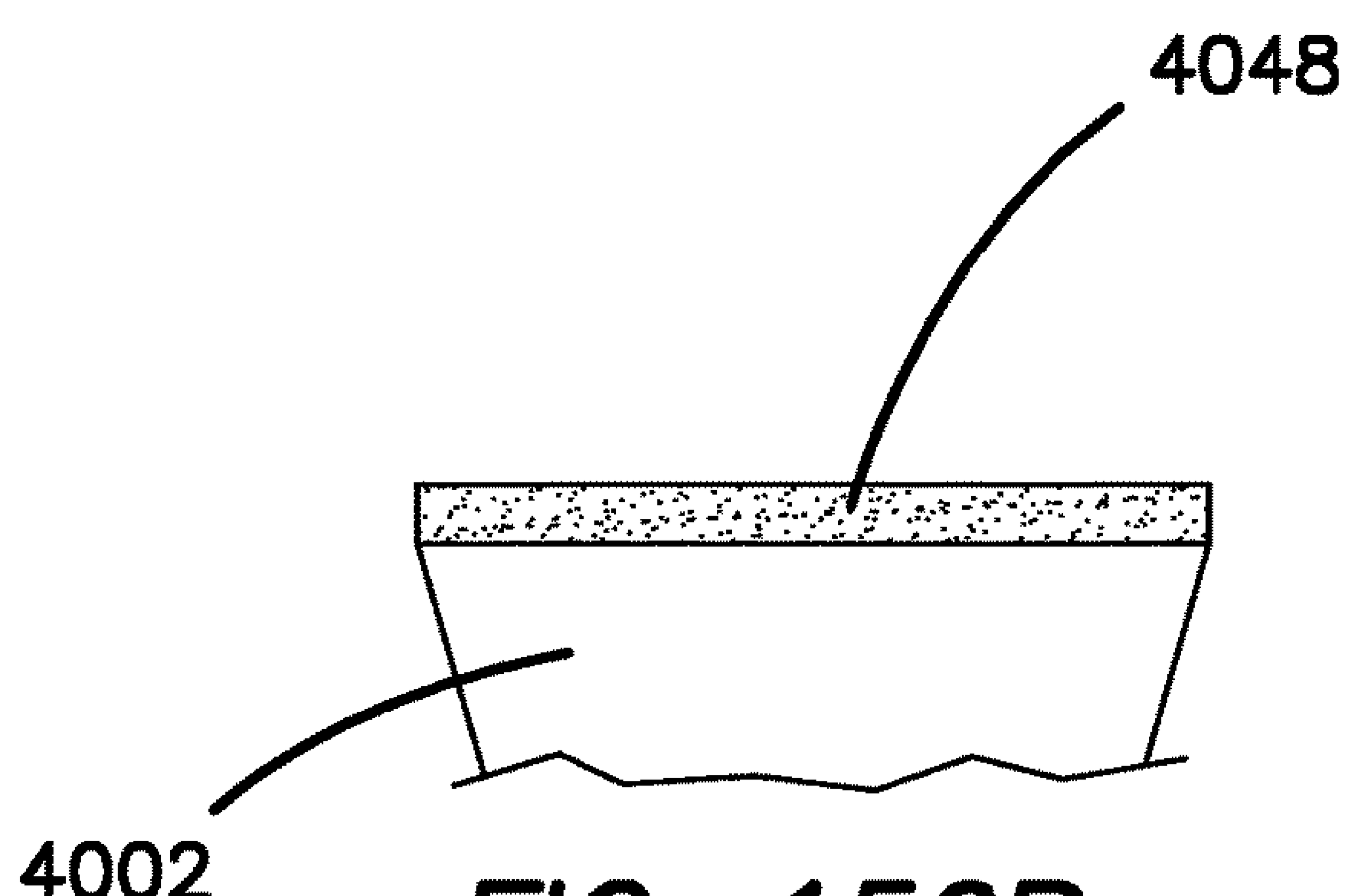


FIG. 156B

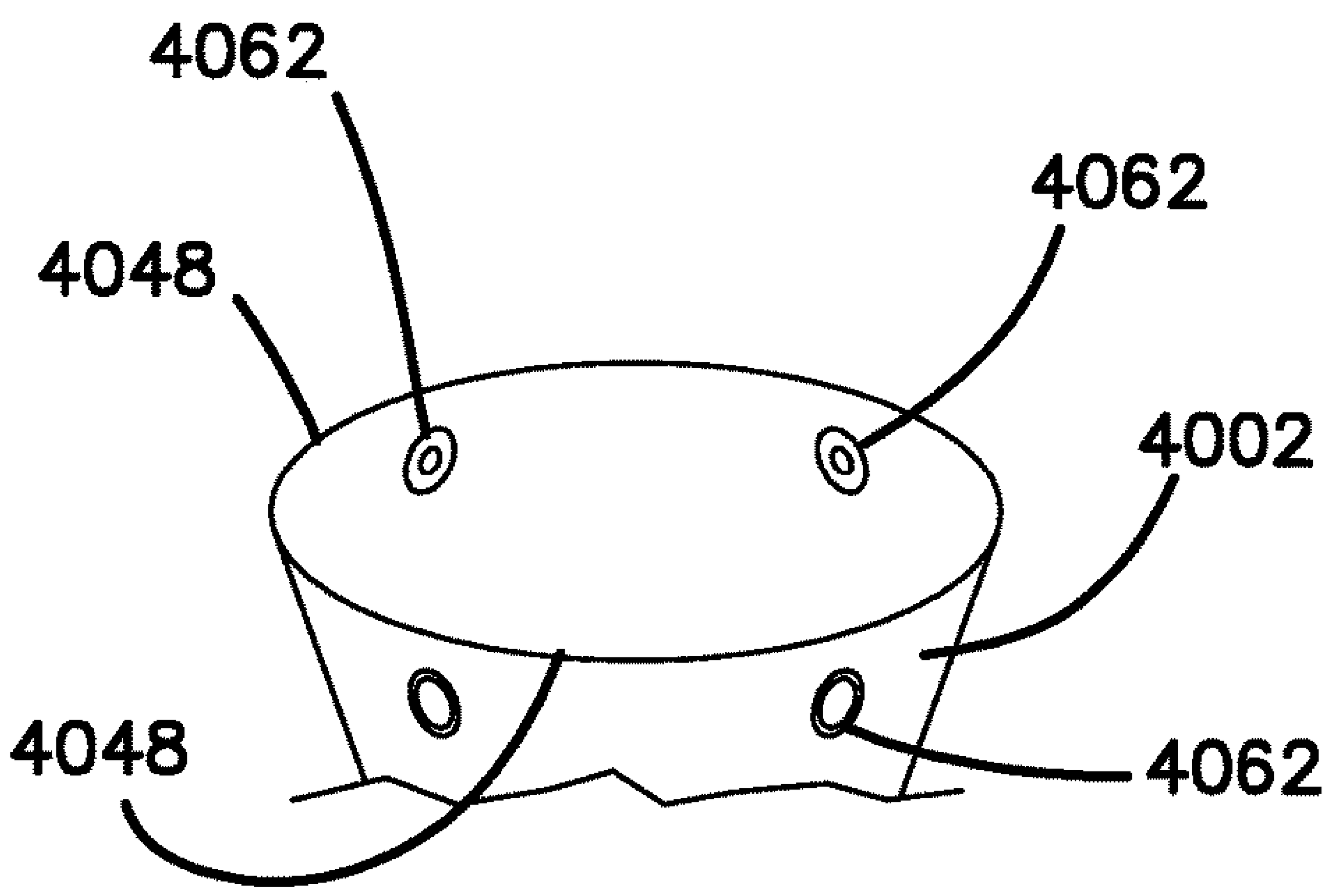


FIG. 157A

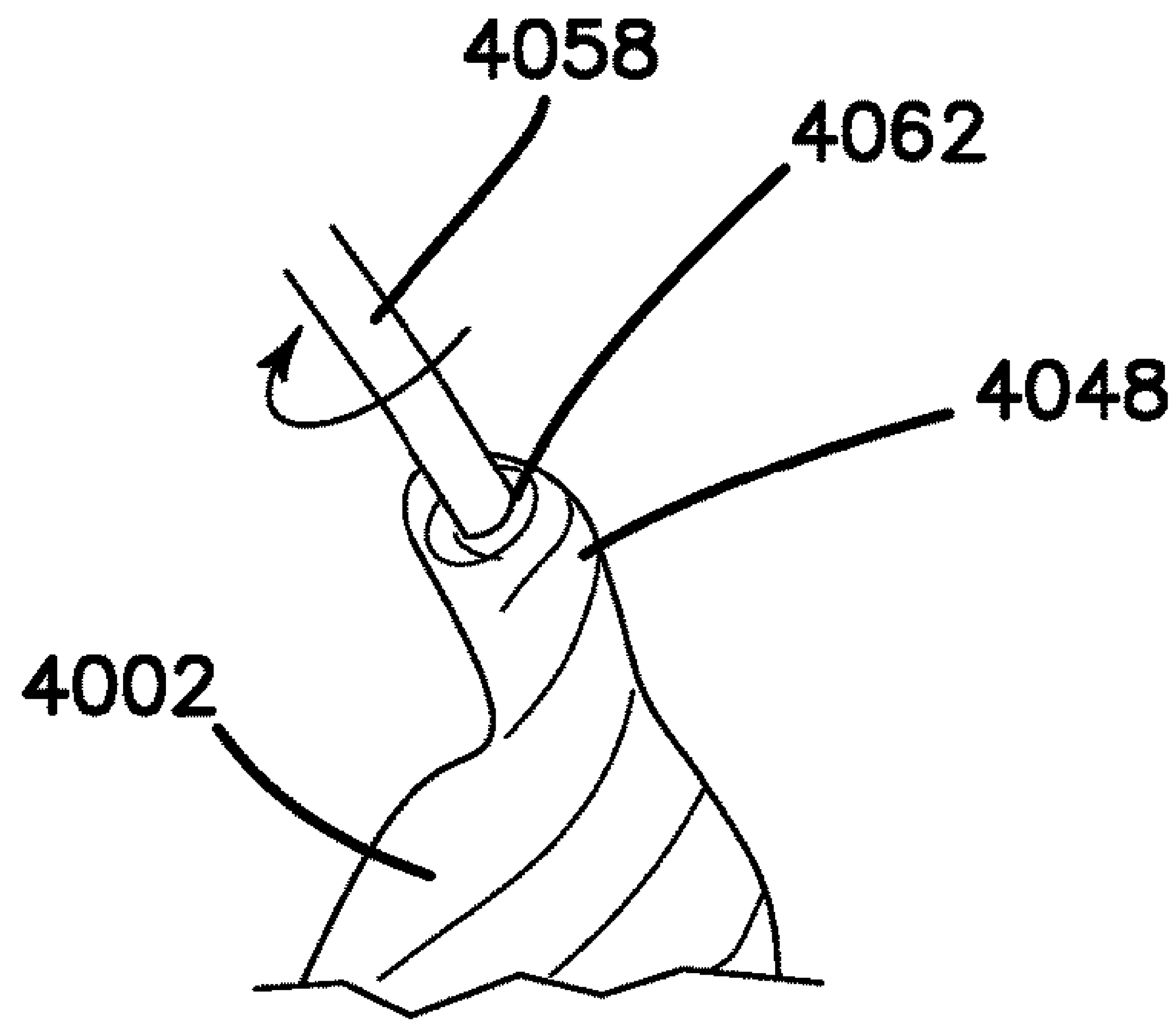


FIG. 157B

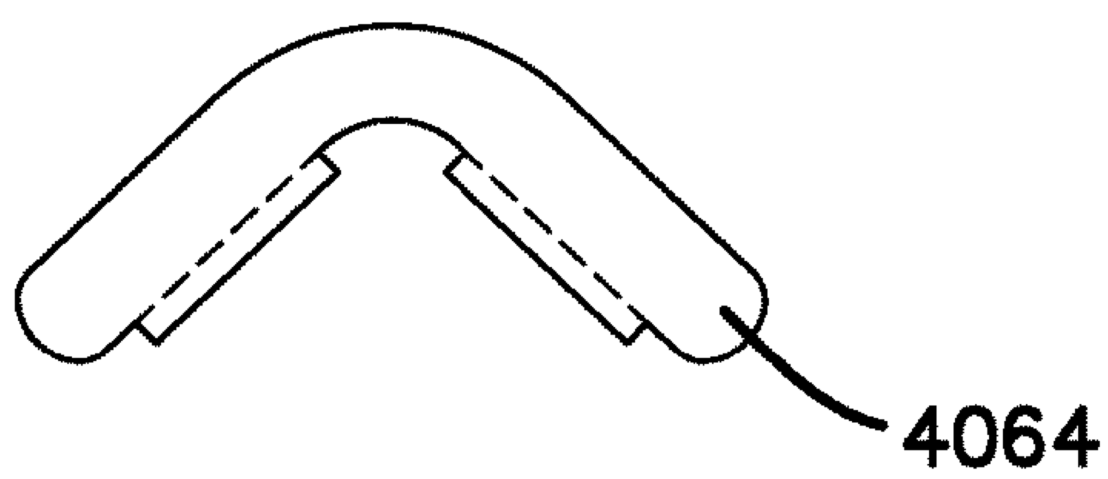


FIG. 158A

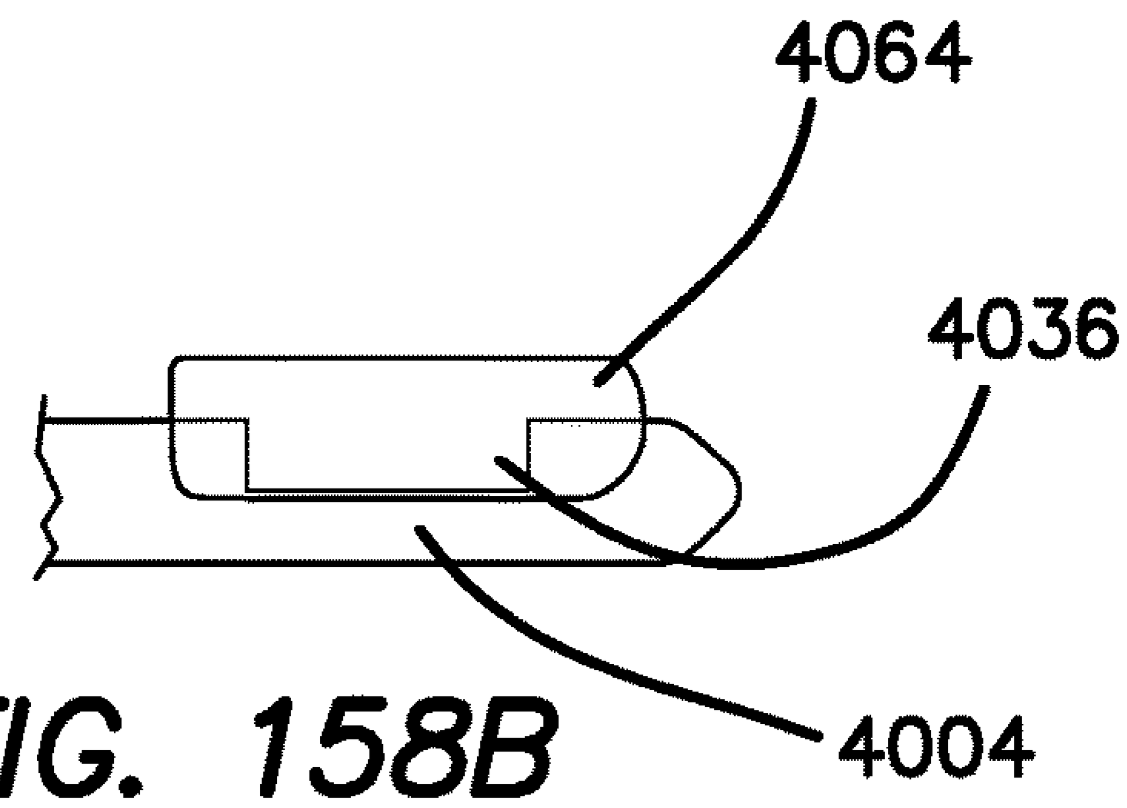


FIG. 158B

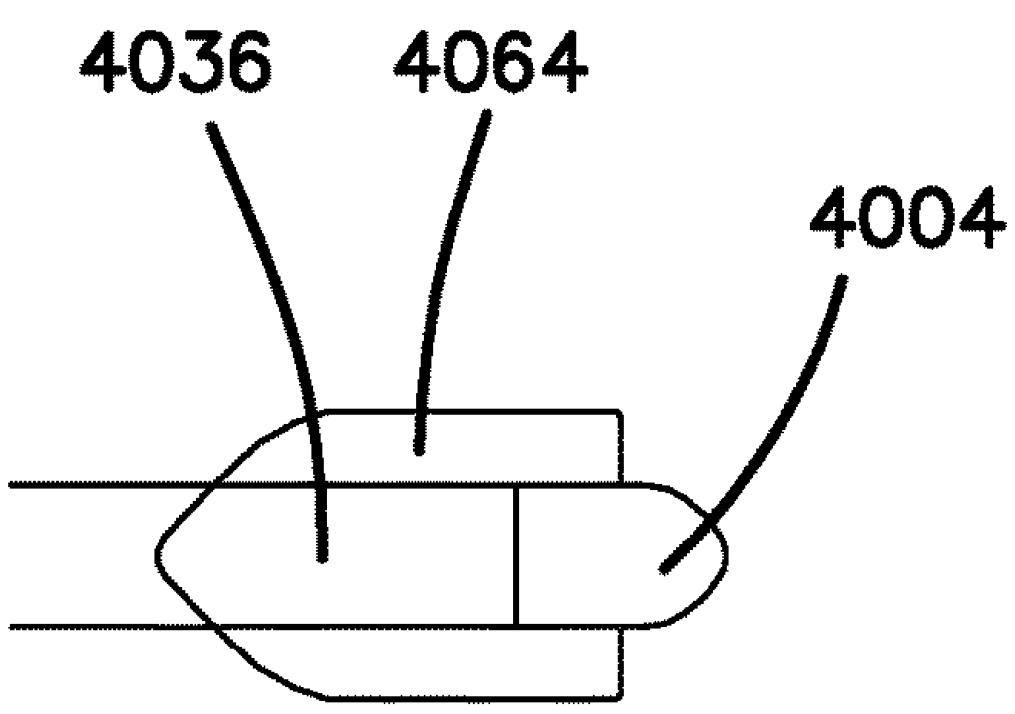


FIG. 158C

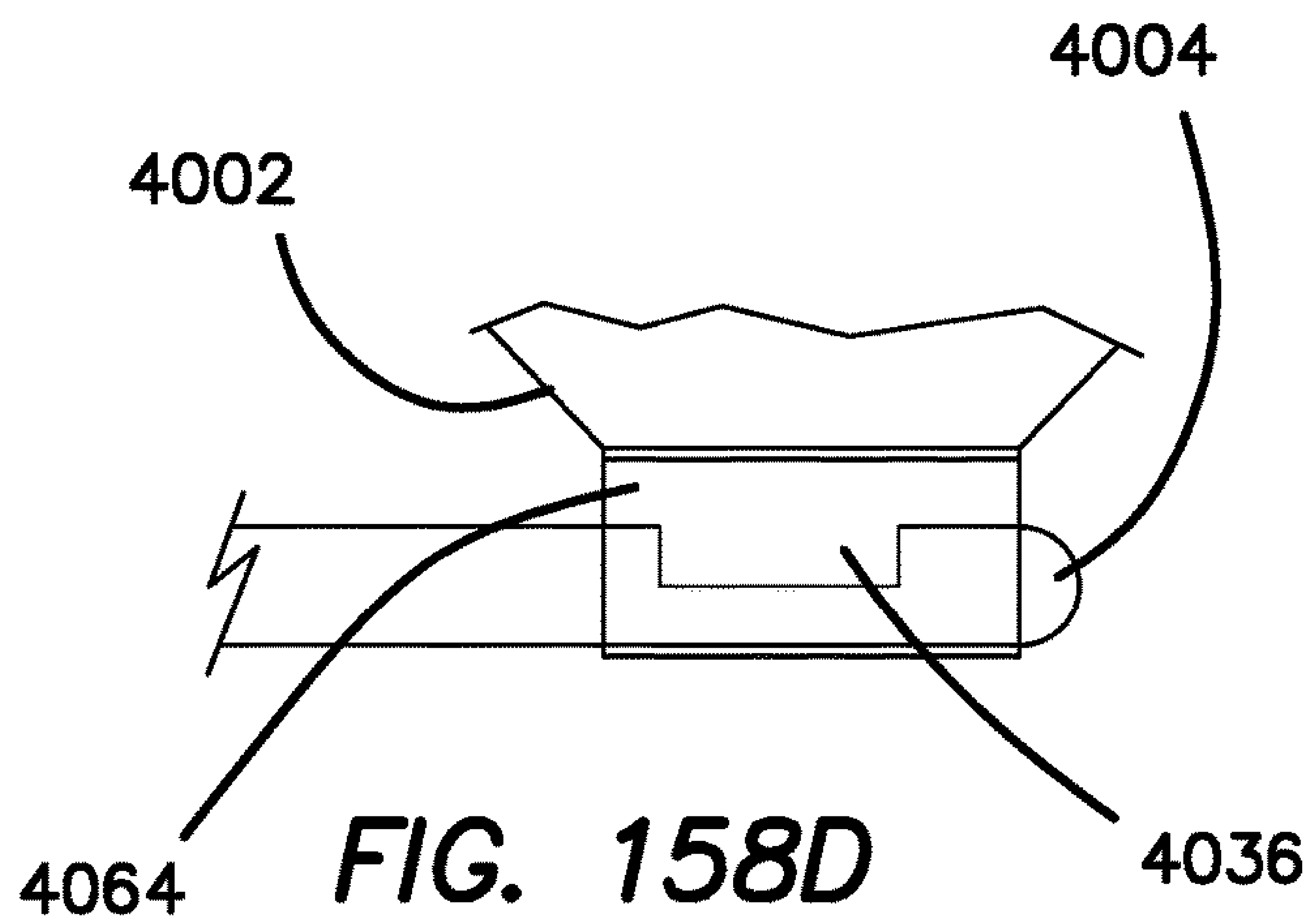


FIG. 158D

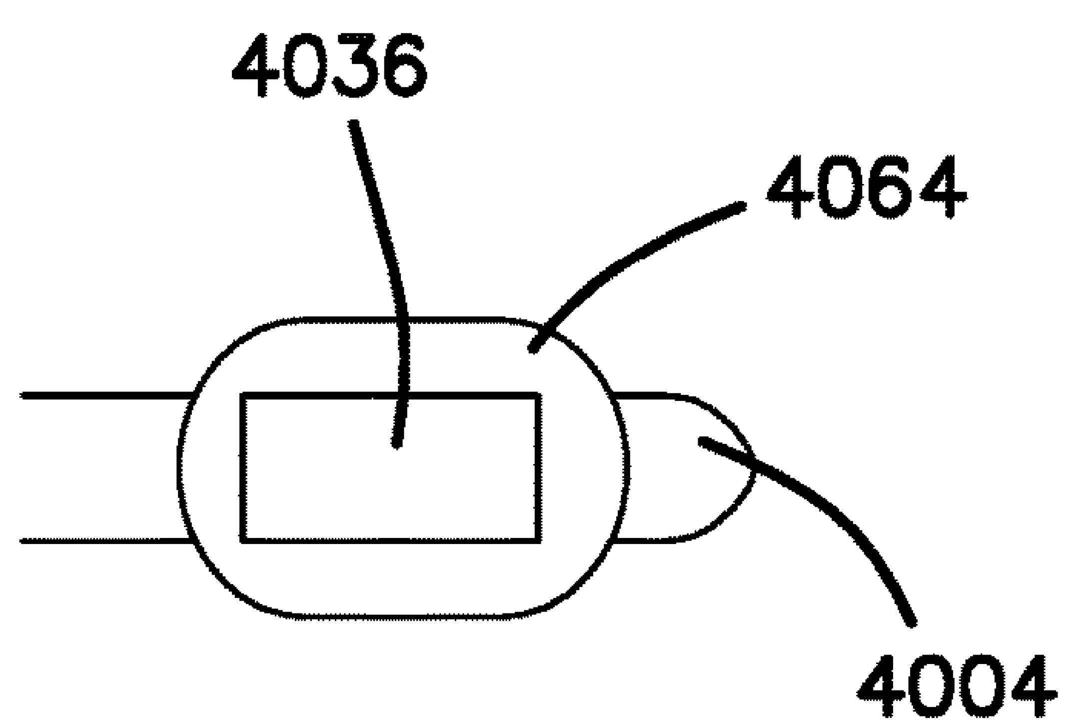


FIG. 158E

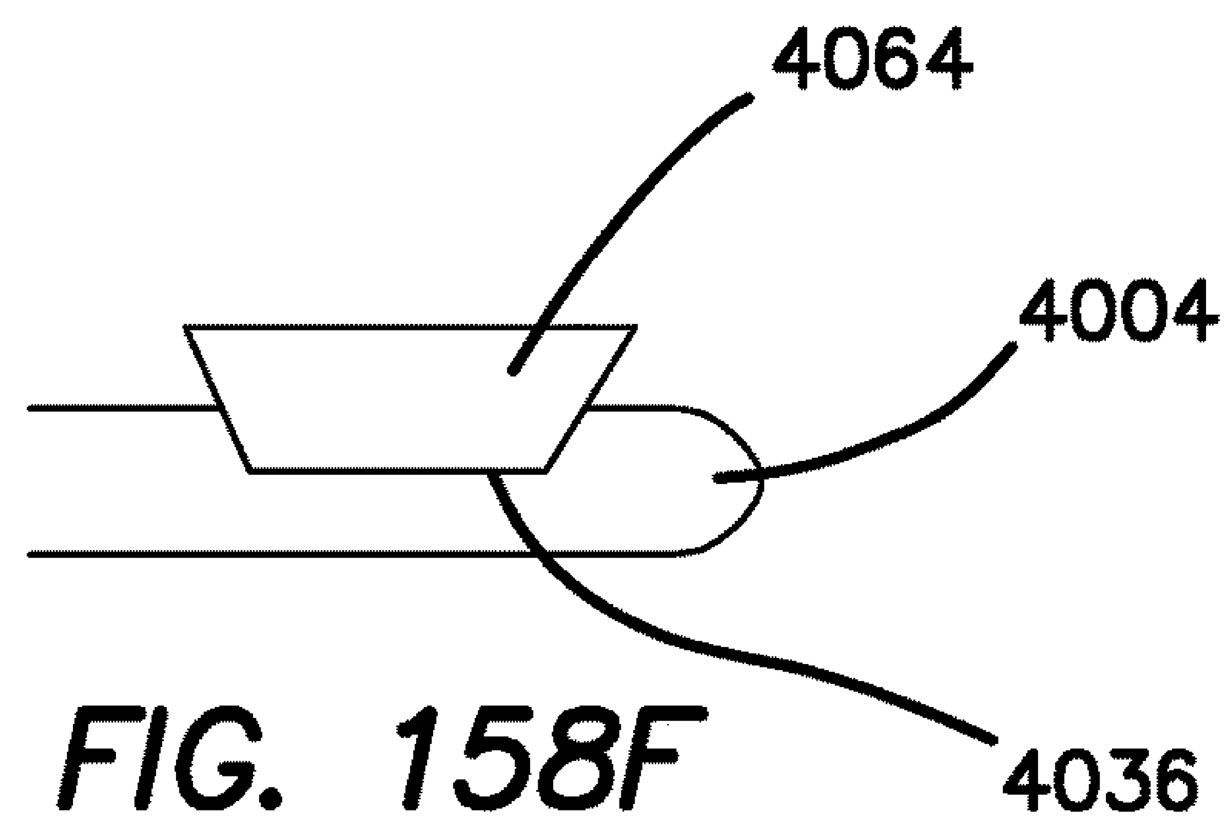


FIG. 158F

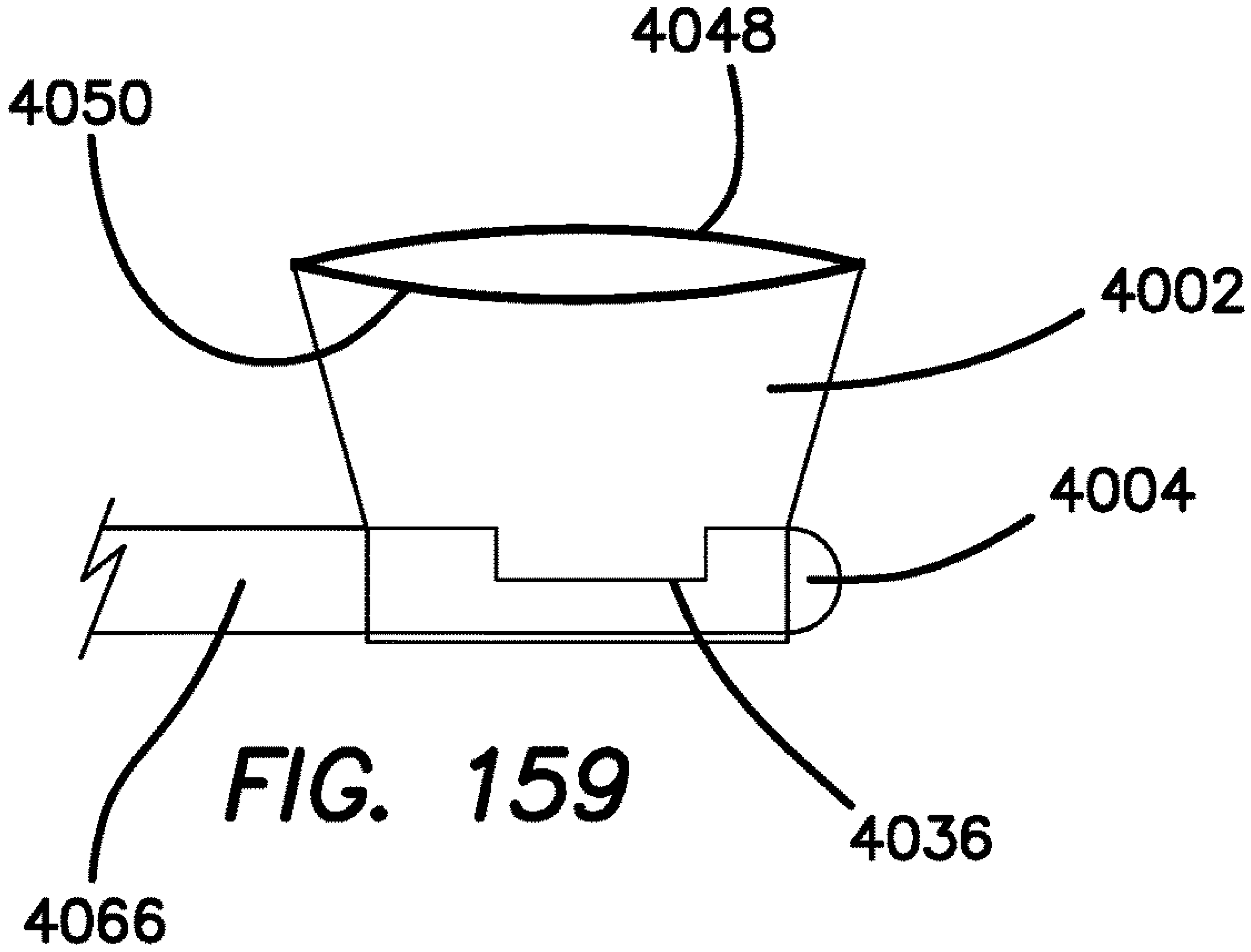


FIG. 159

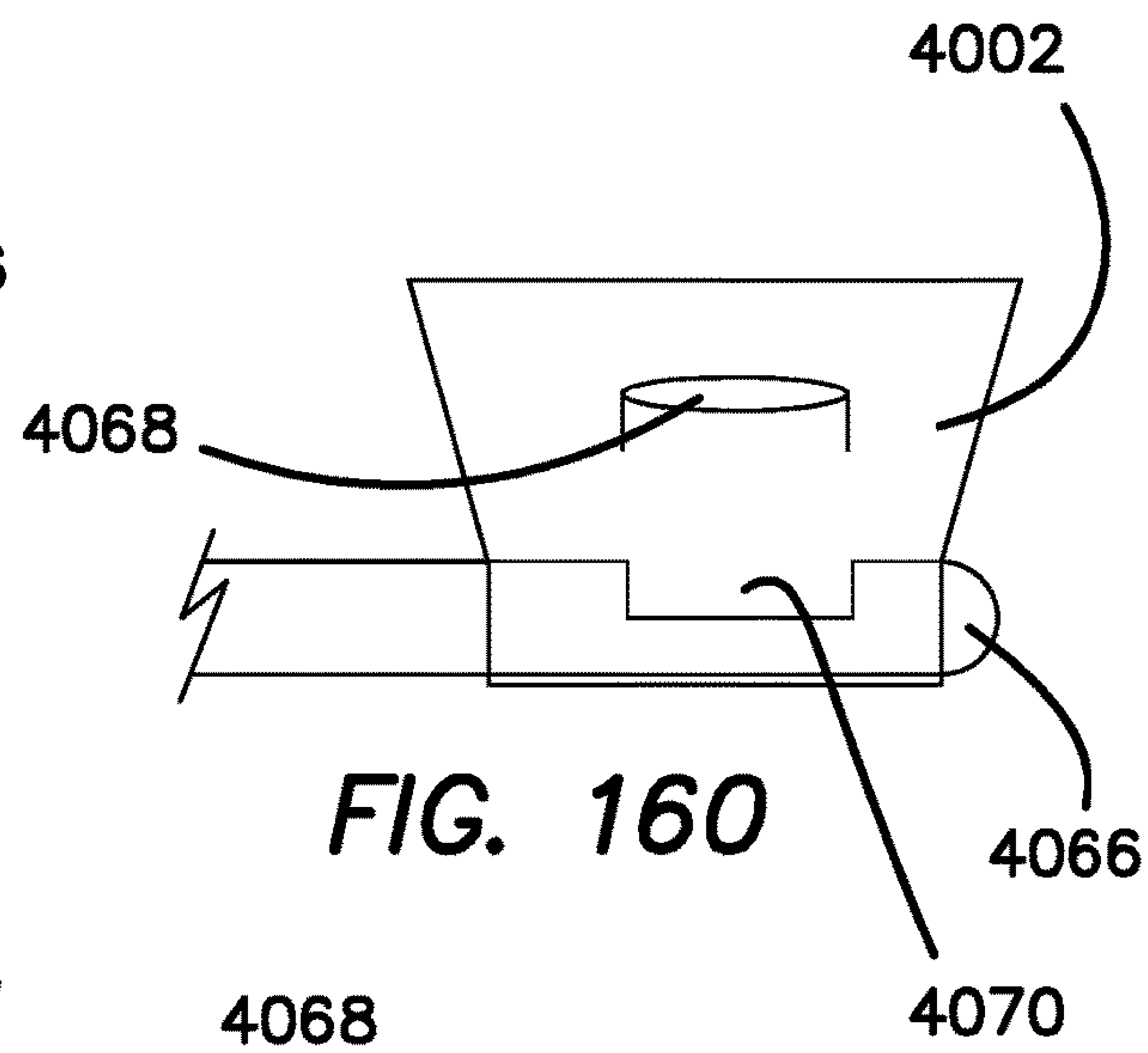


FIG. 160

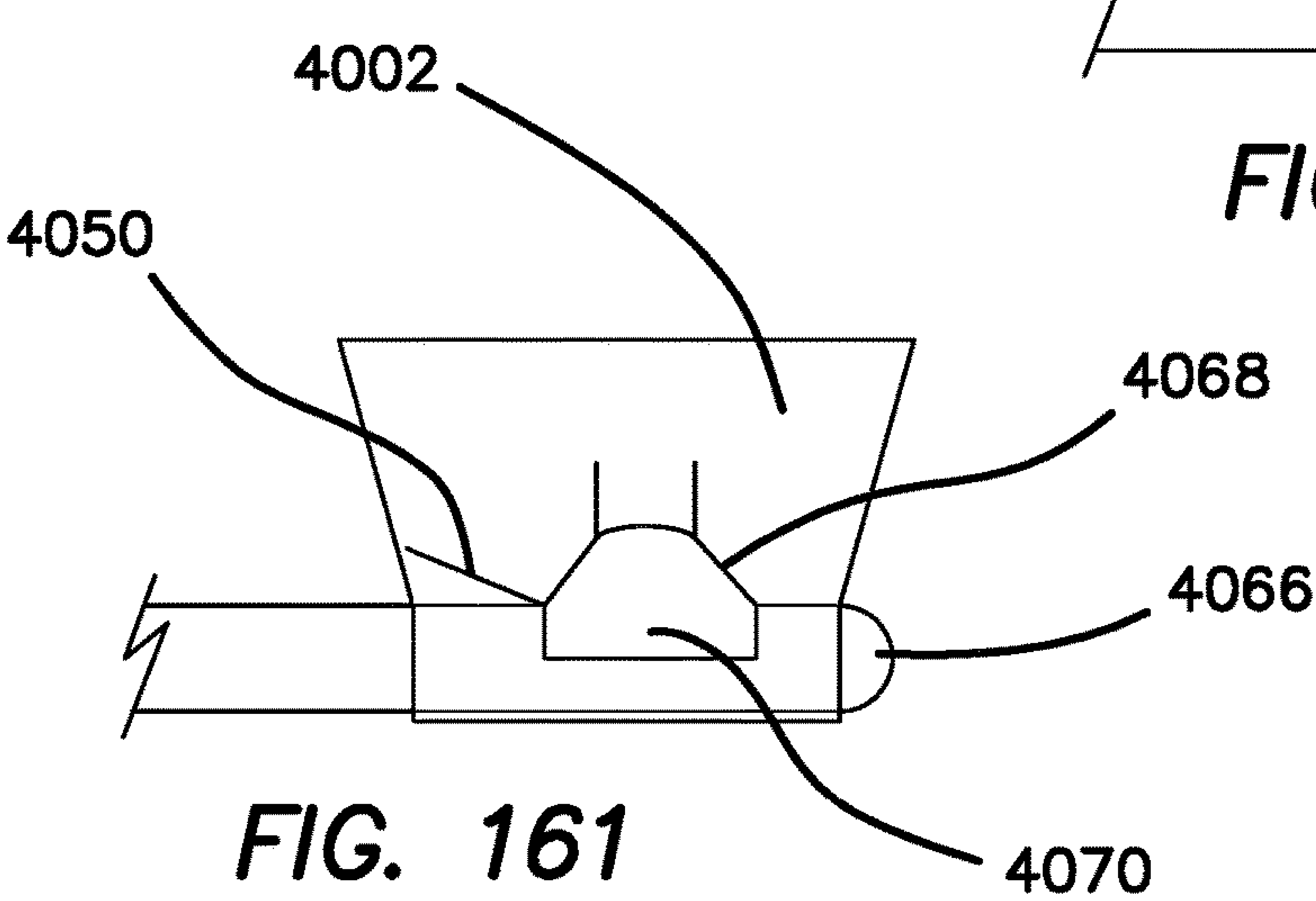


FIG. 161

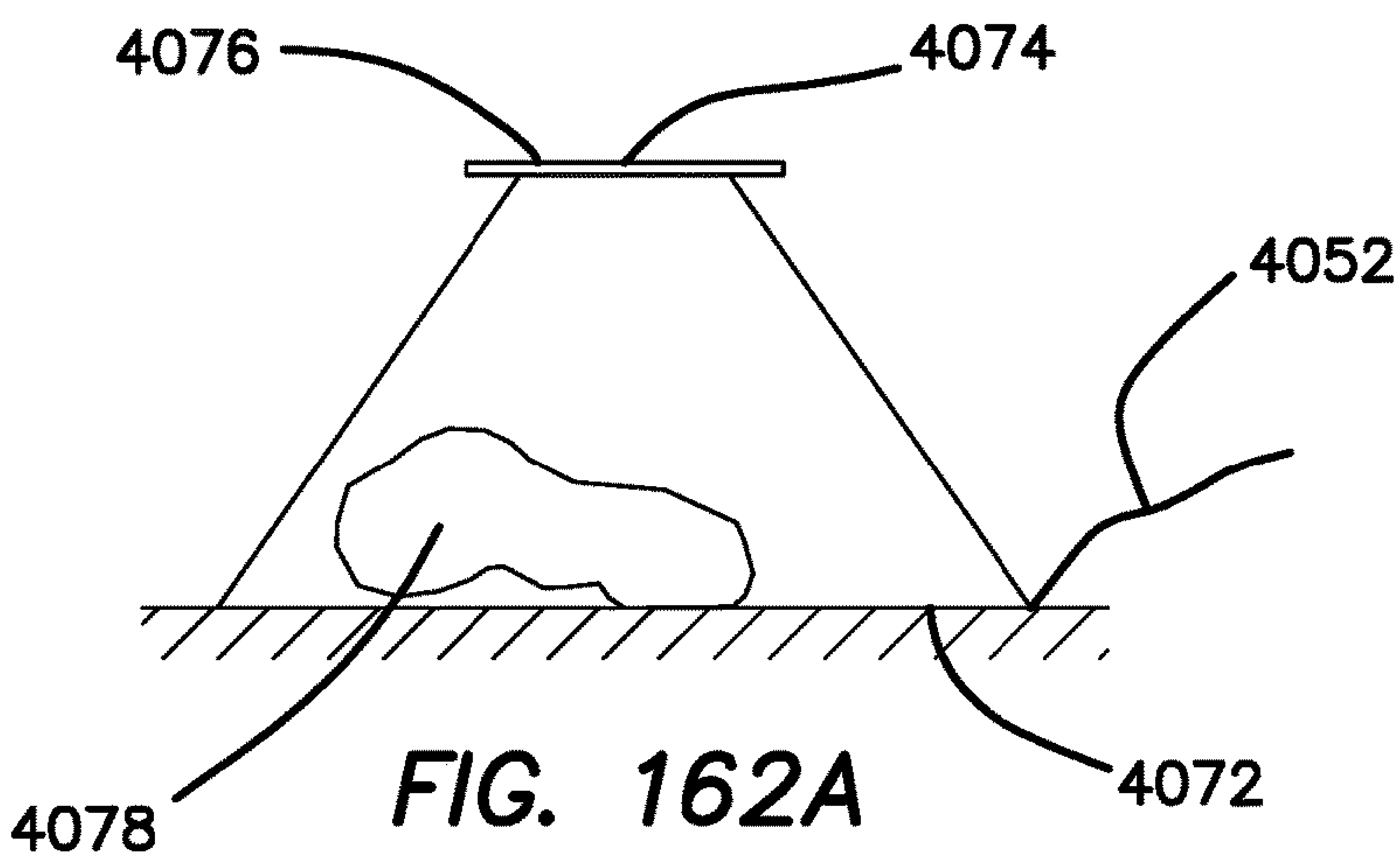


FIG. 162A

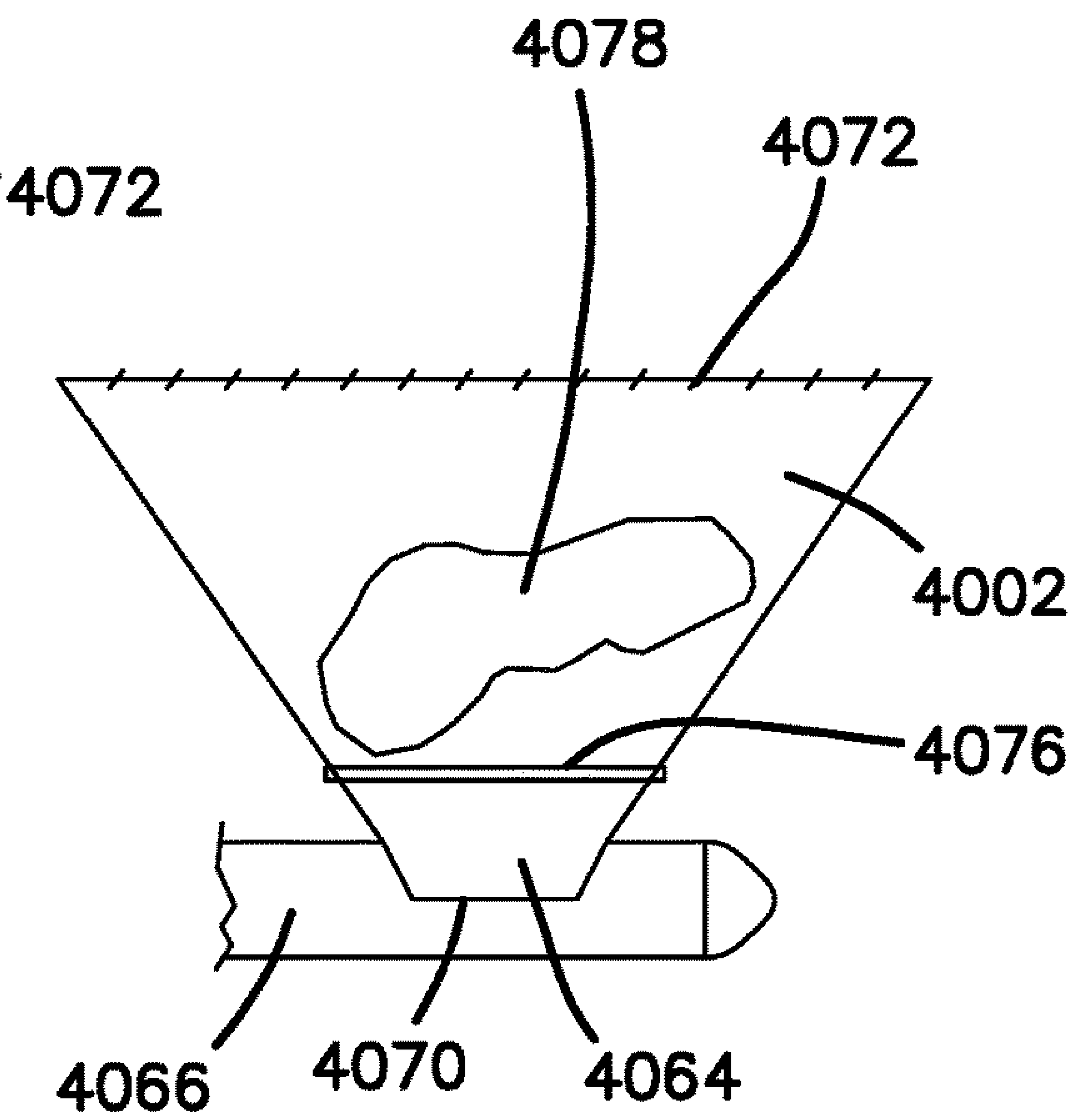


FIG. 162B

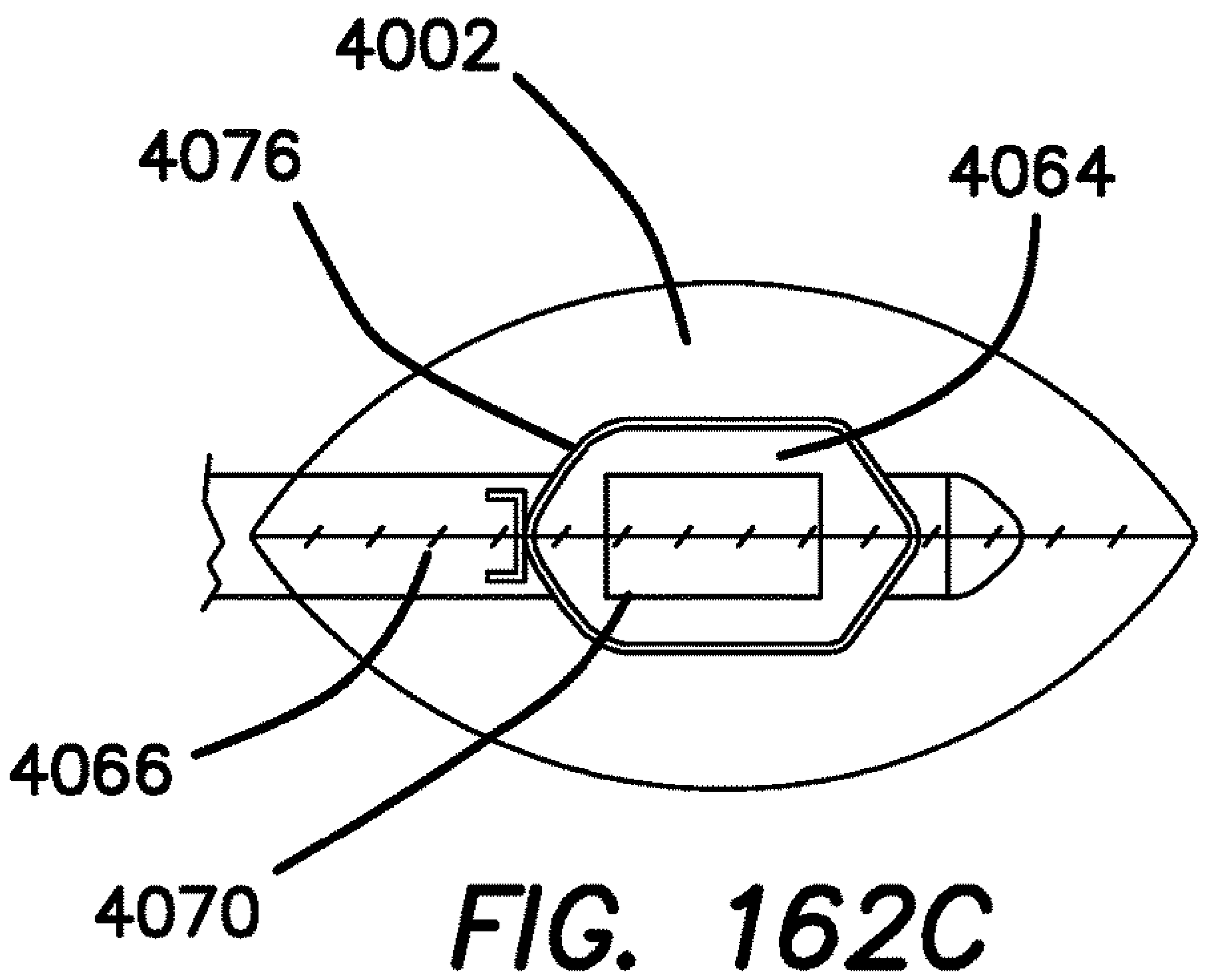


FIG. 162C

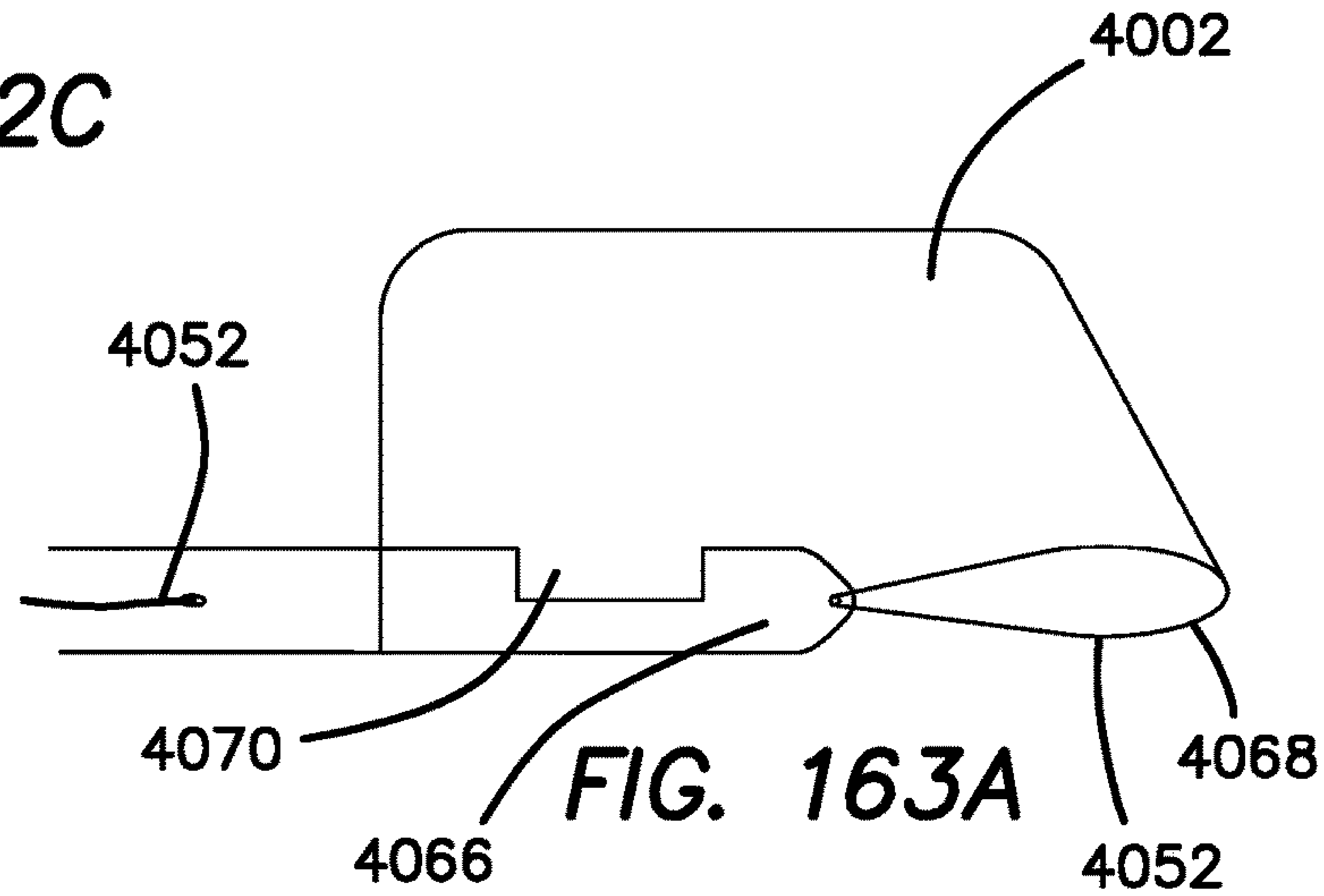


FIG. 163A

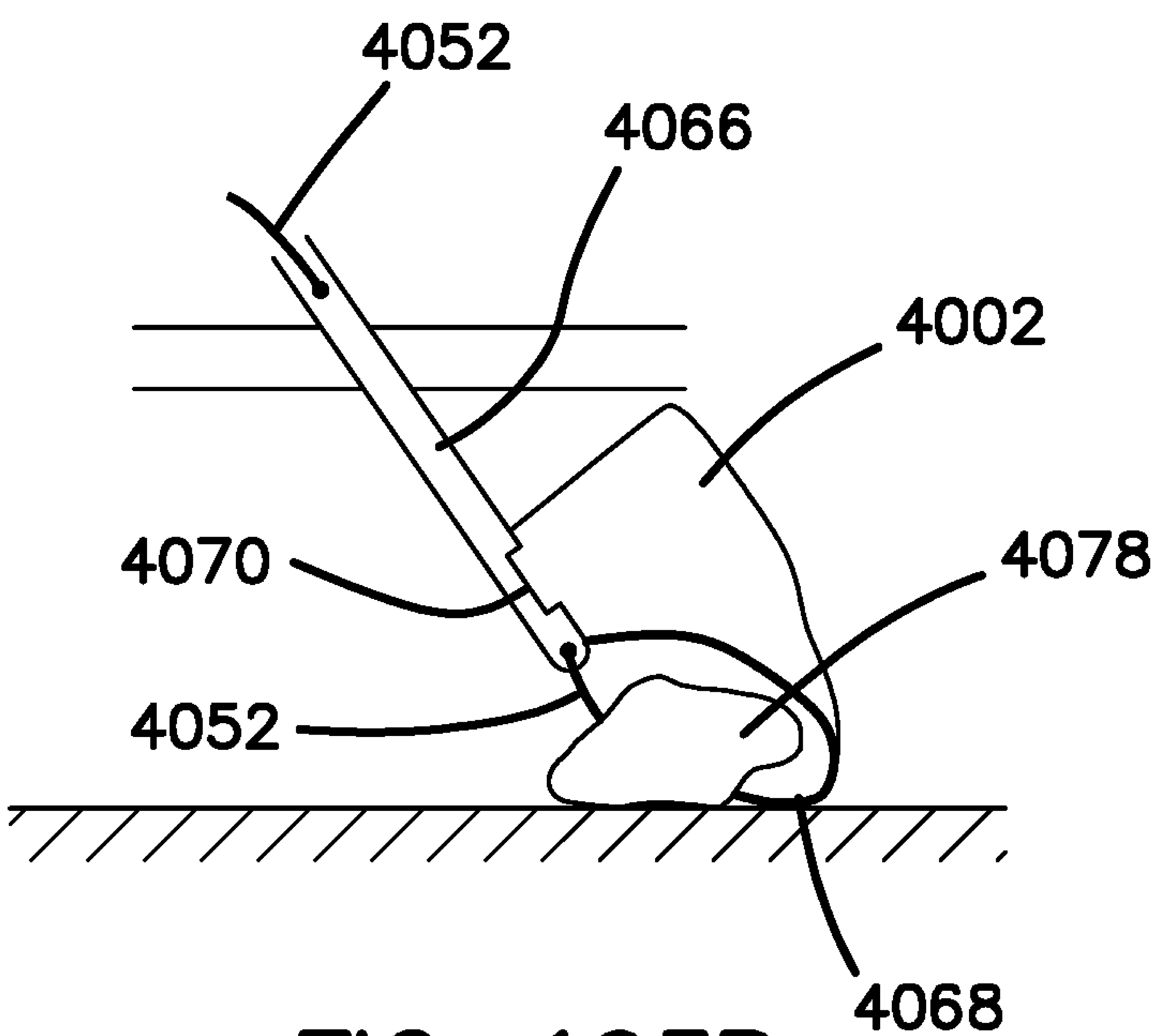


FIG. 163B

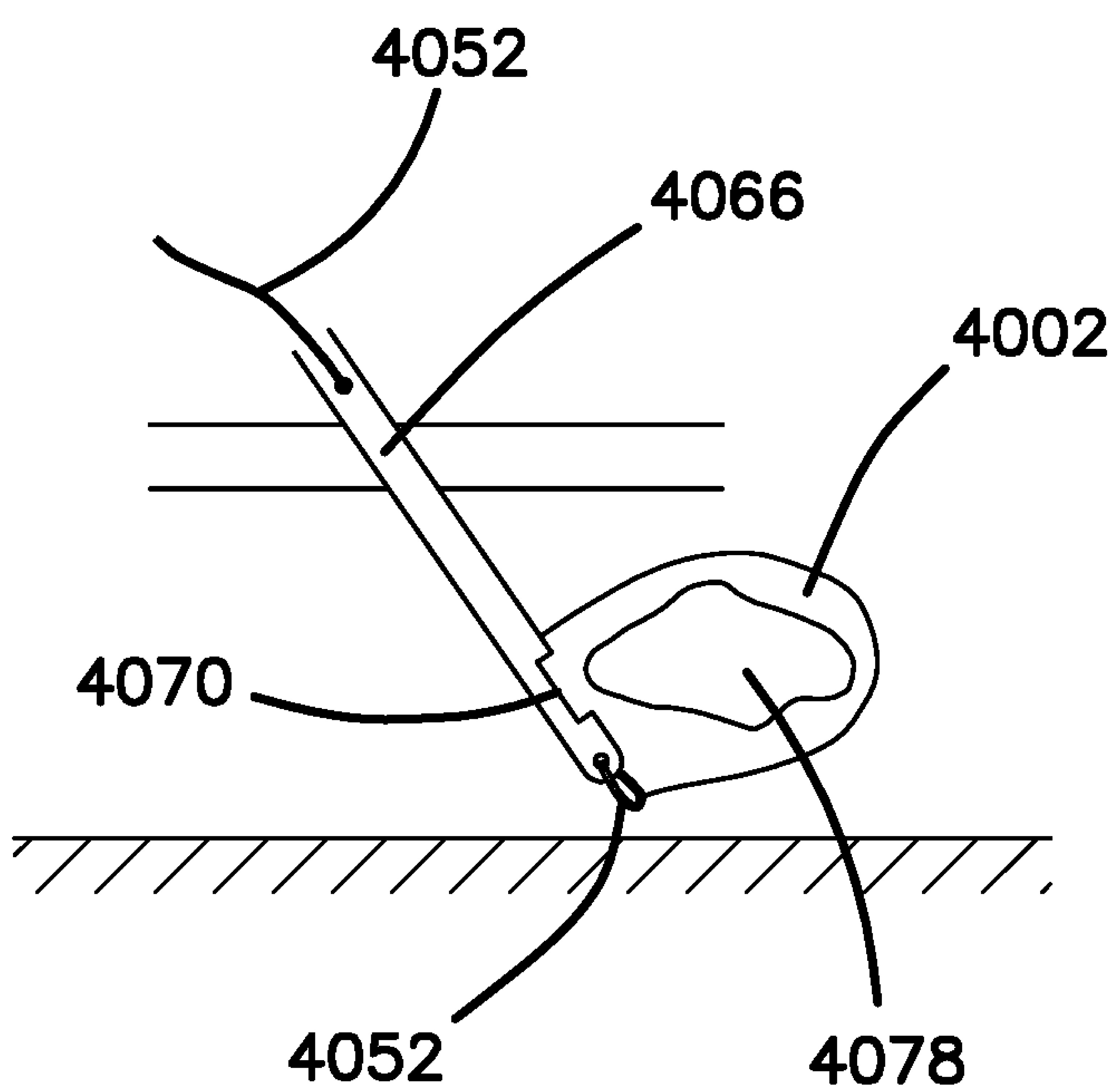


FIG. 163C

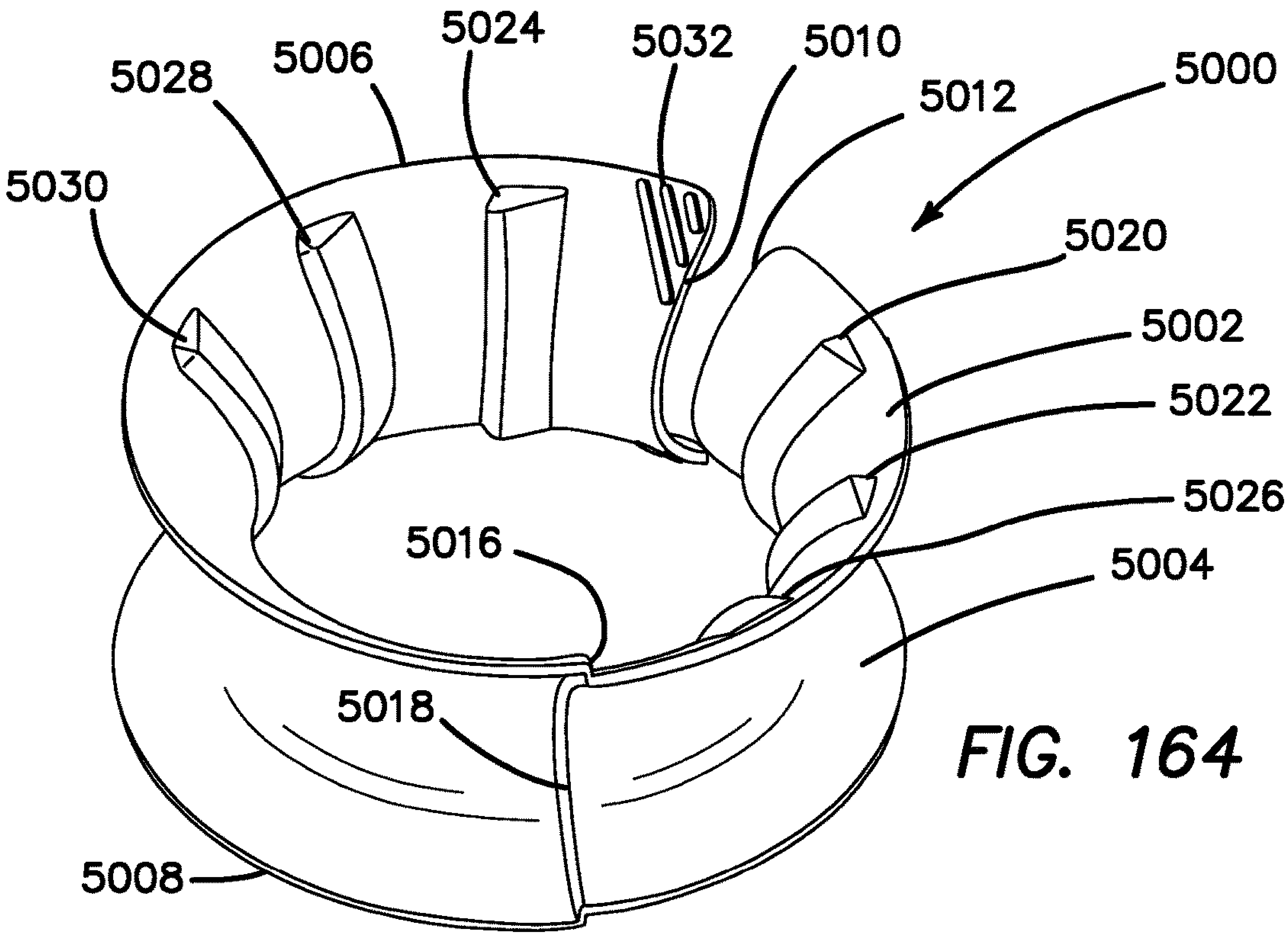


FIG. 164

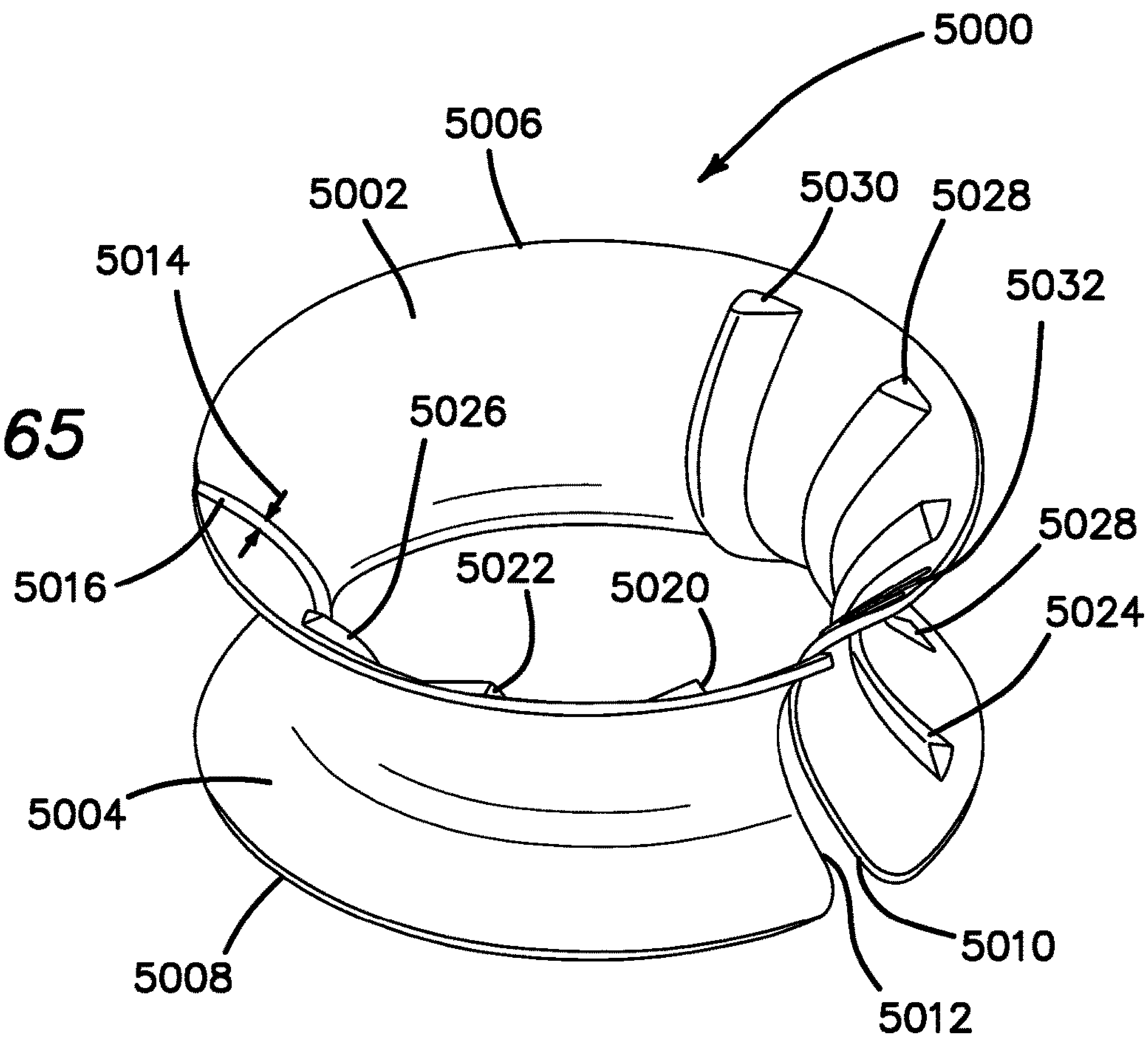
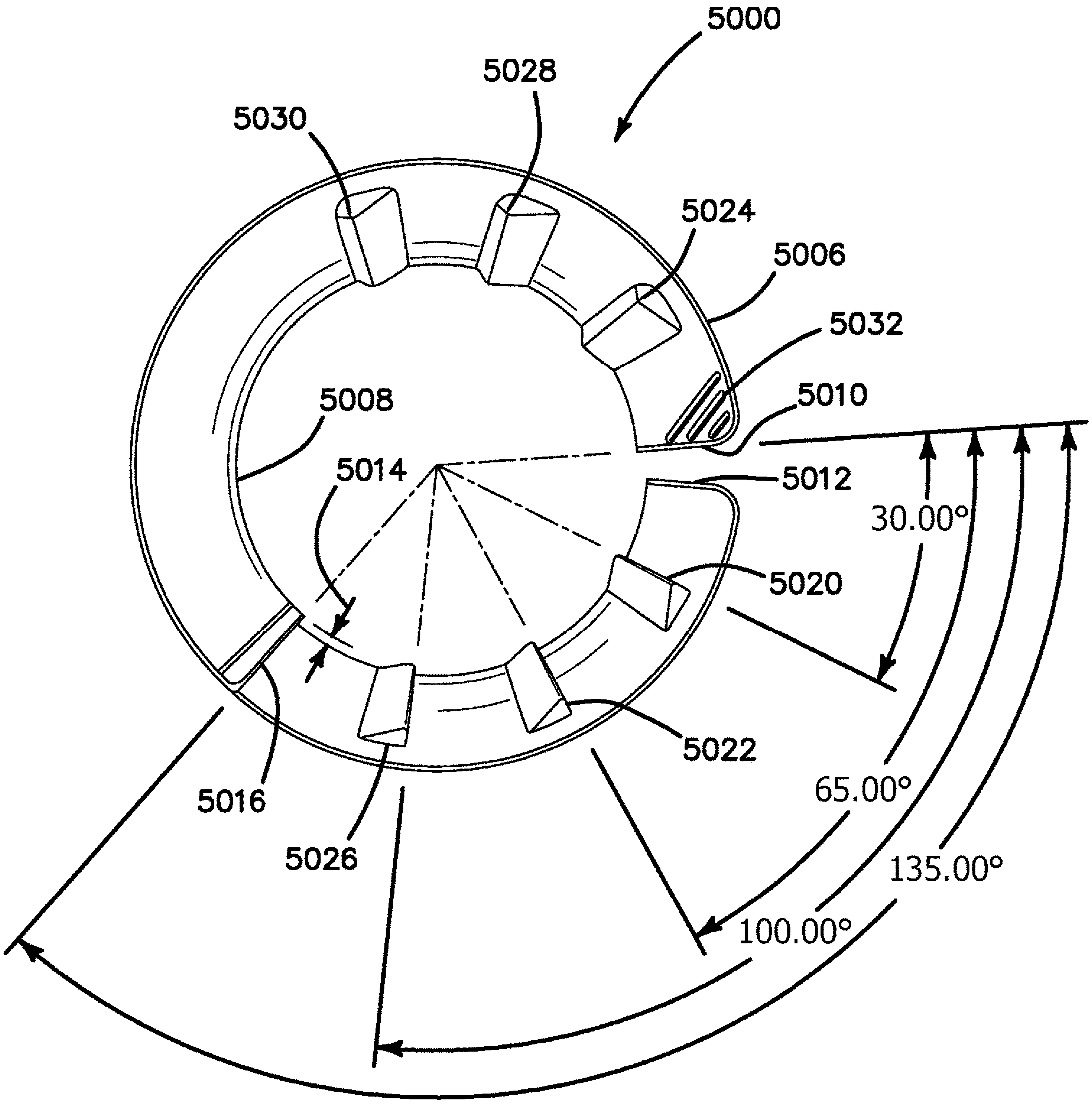


FIG. 165



5000
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5030
5024
5006
5032
5010
5008
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5020
5022
5016
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5026
135.00°
100.00°

FIG. 166

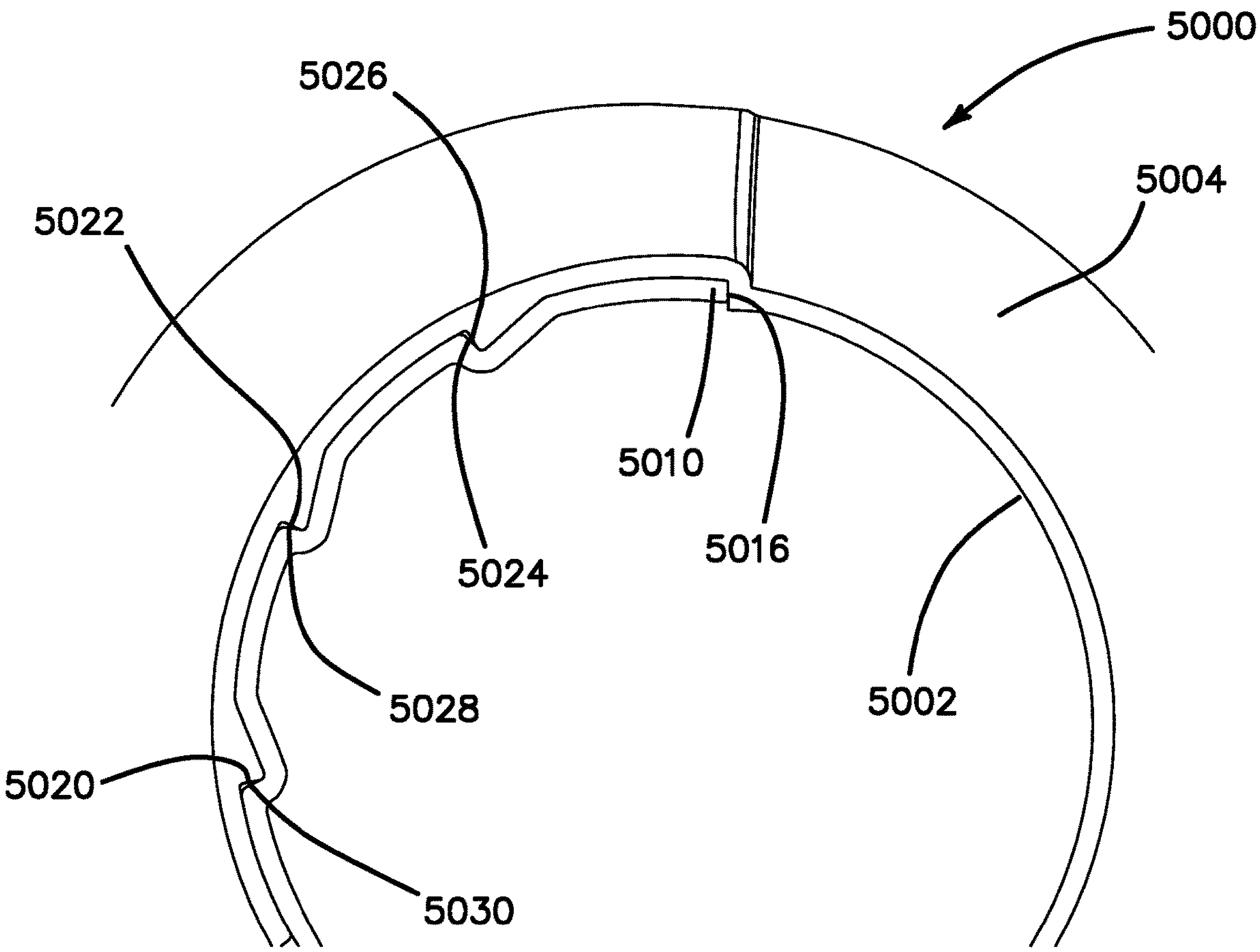


FIG. 167

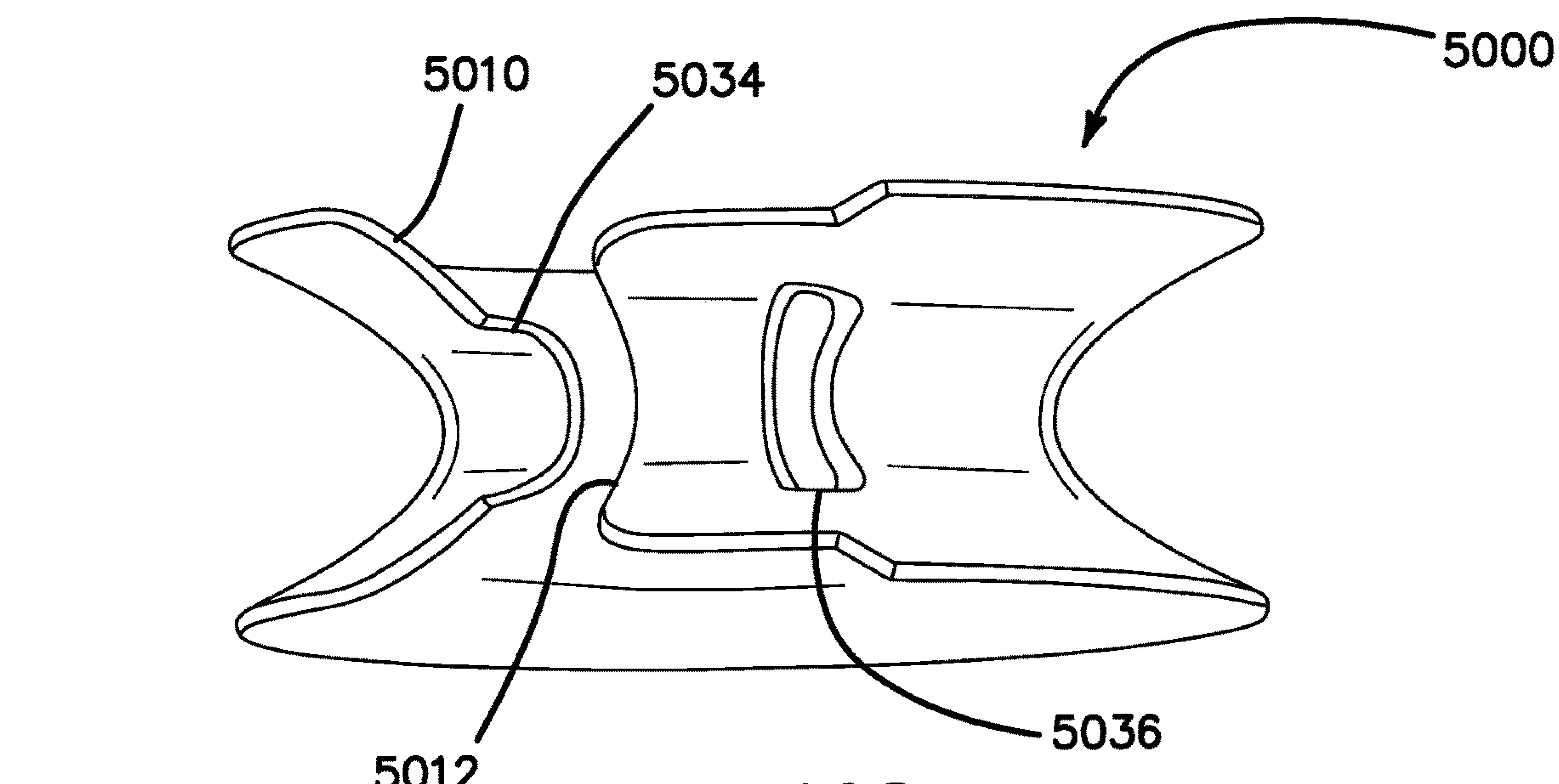
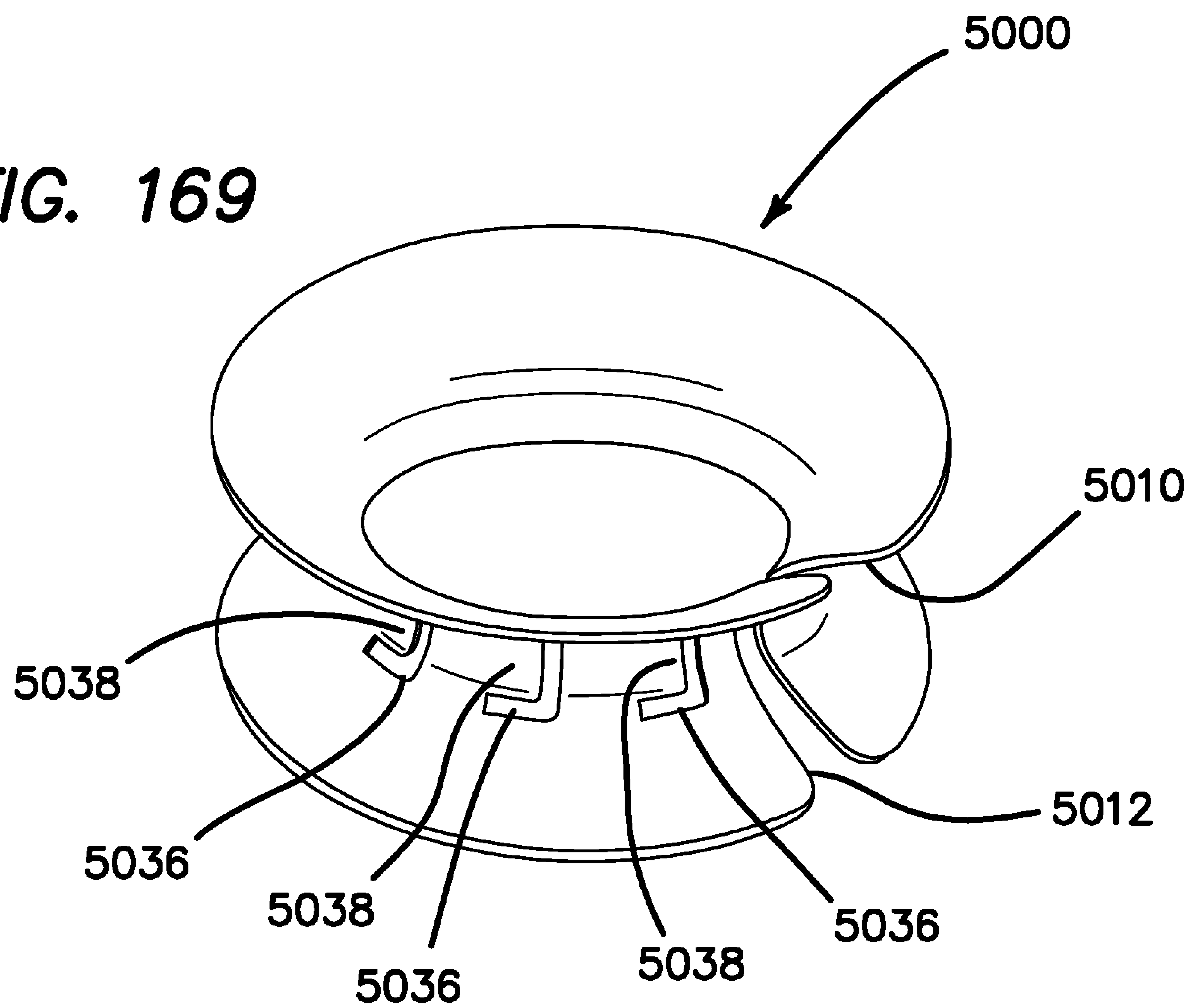


FIG. 168

FIG. 169



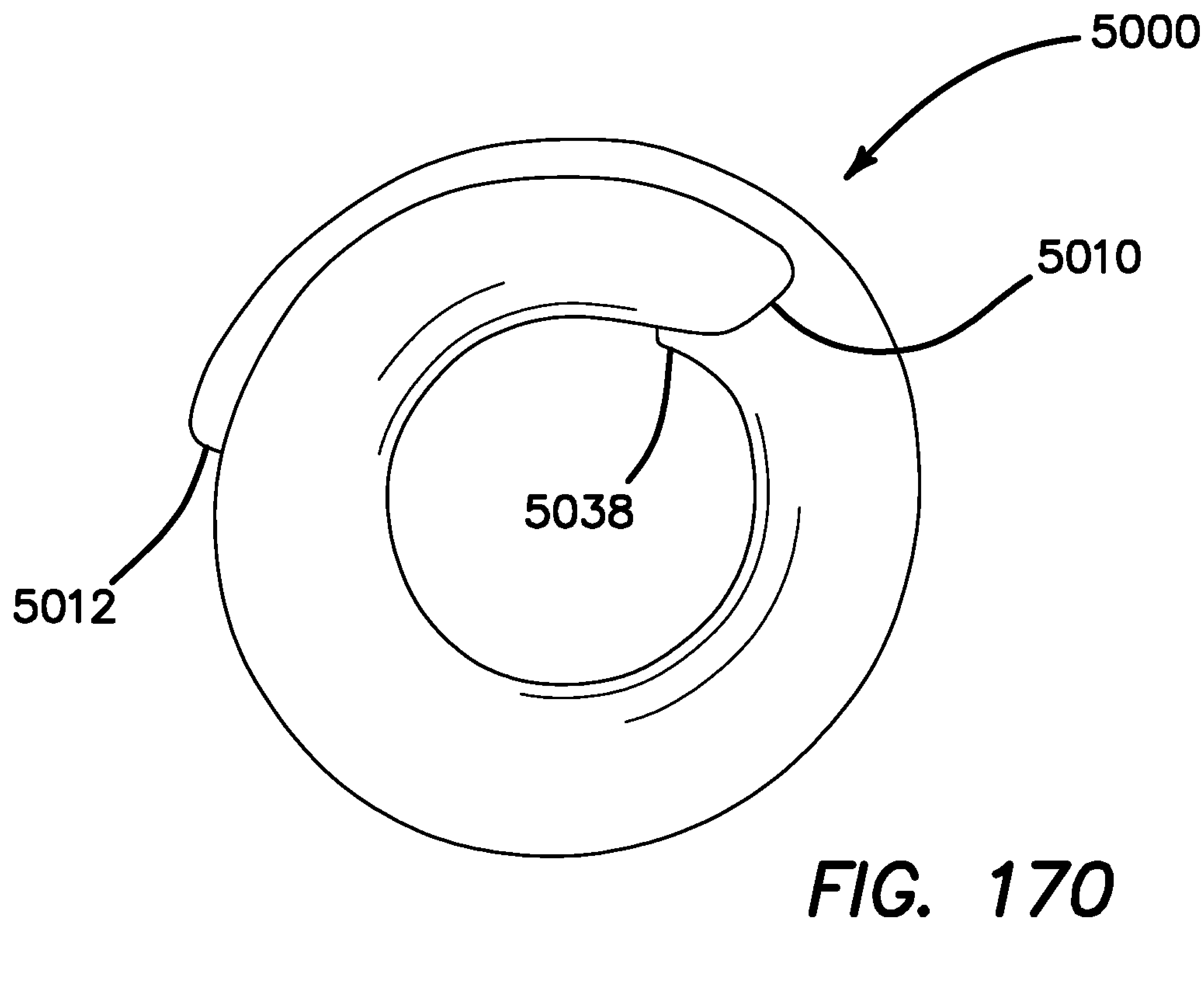


FIG. 170

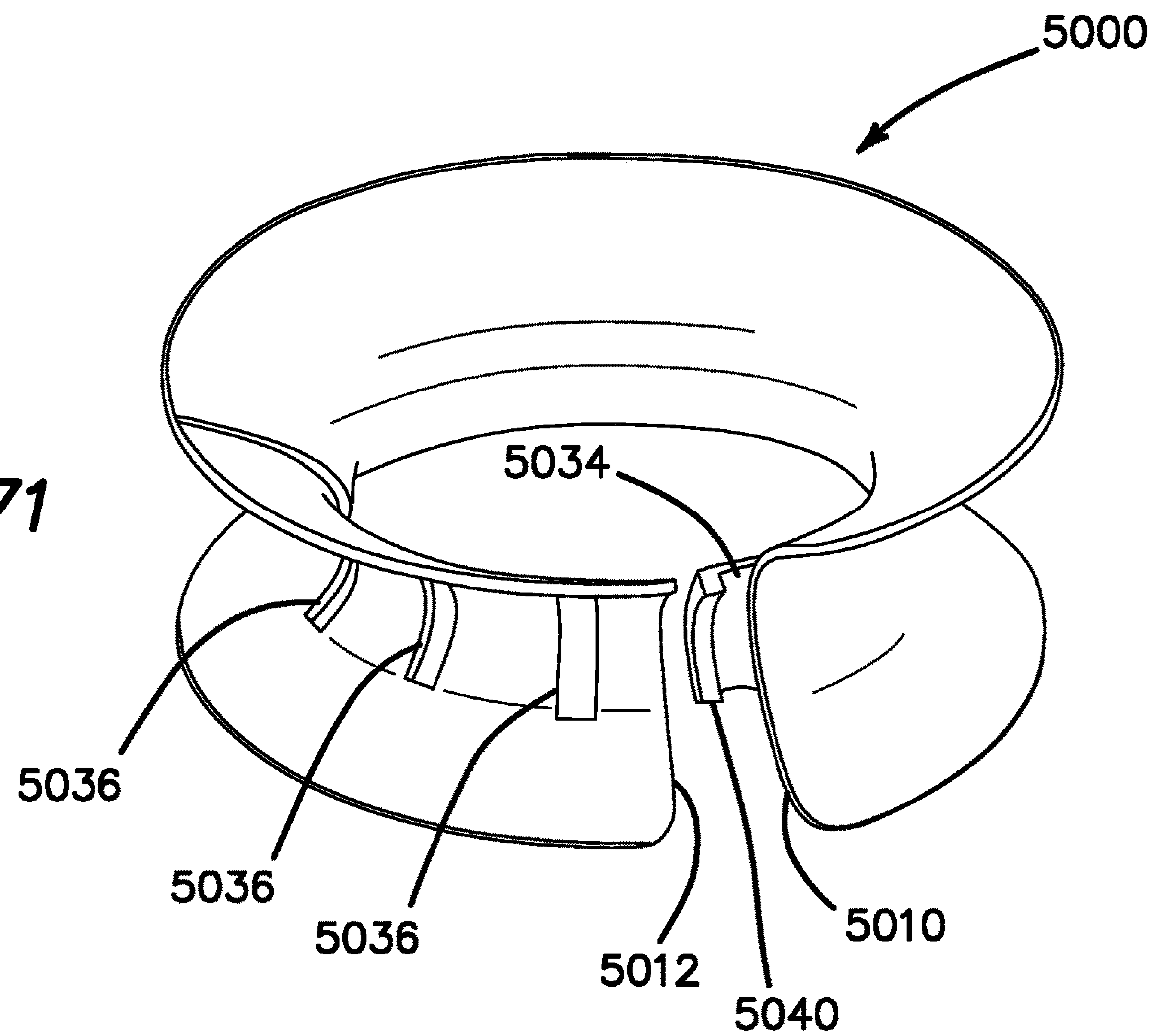


FIG. 171

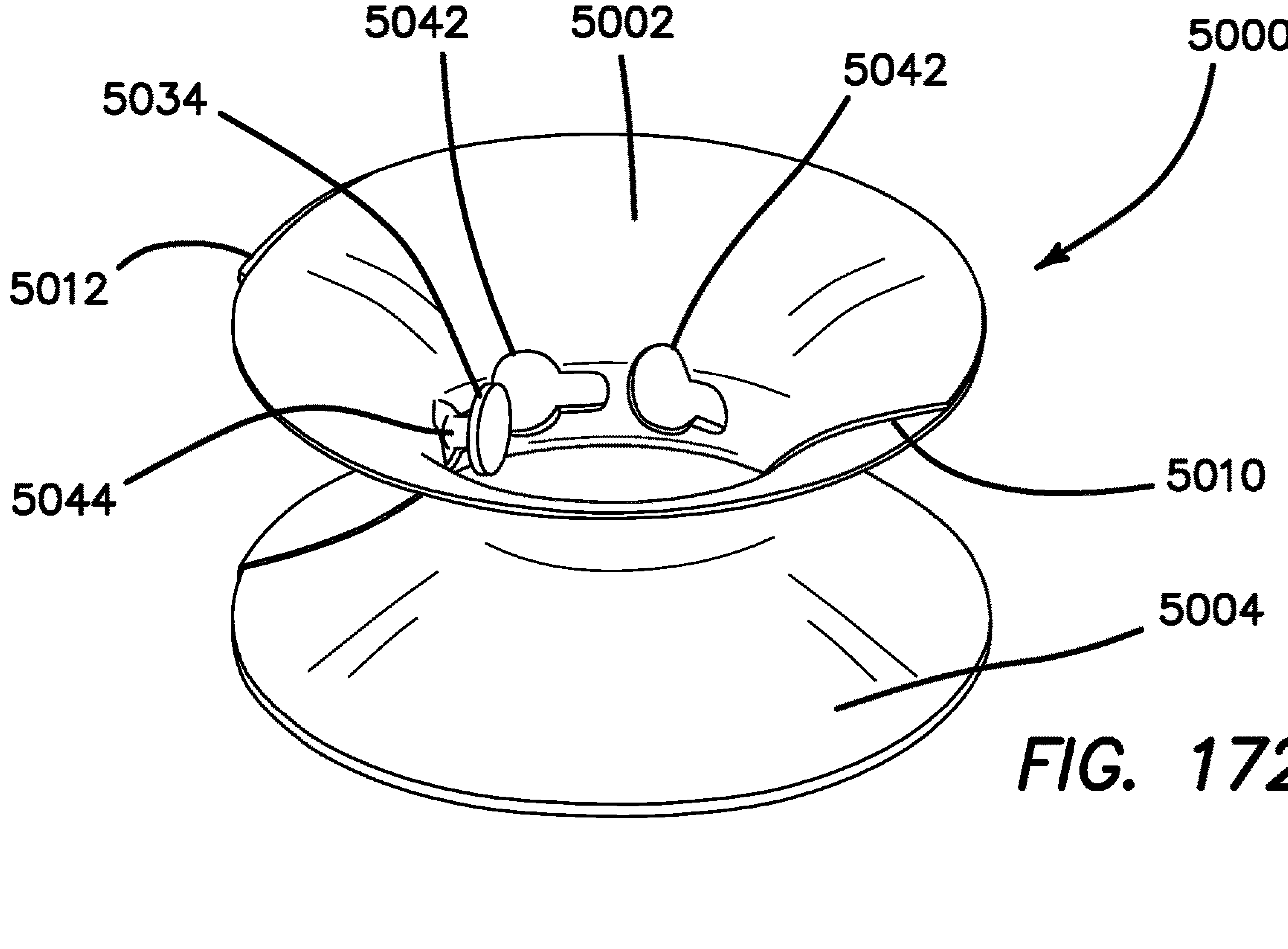


FIG. 172

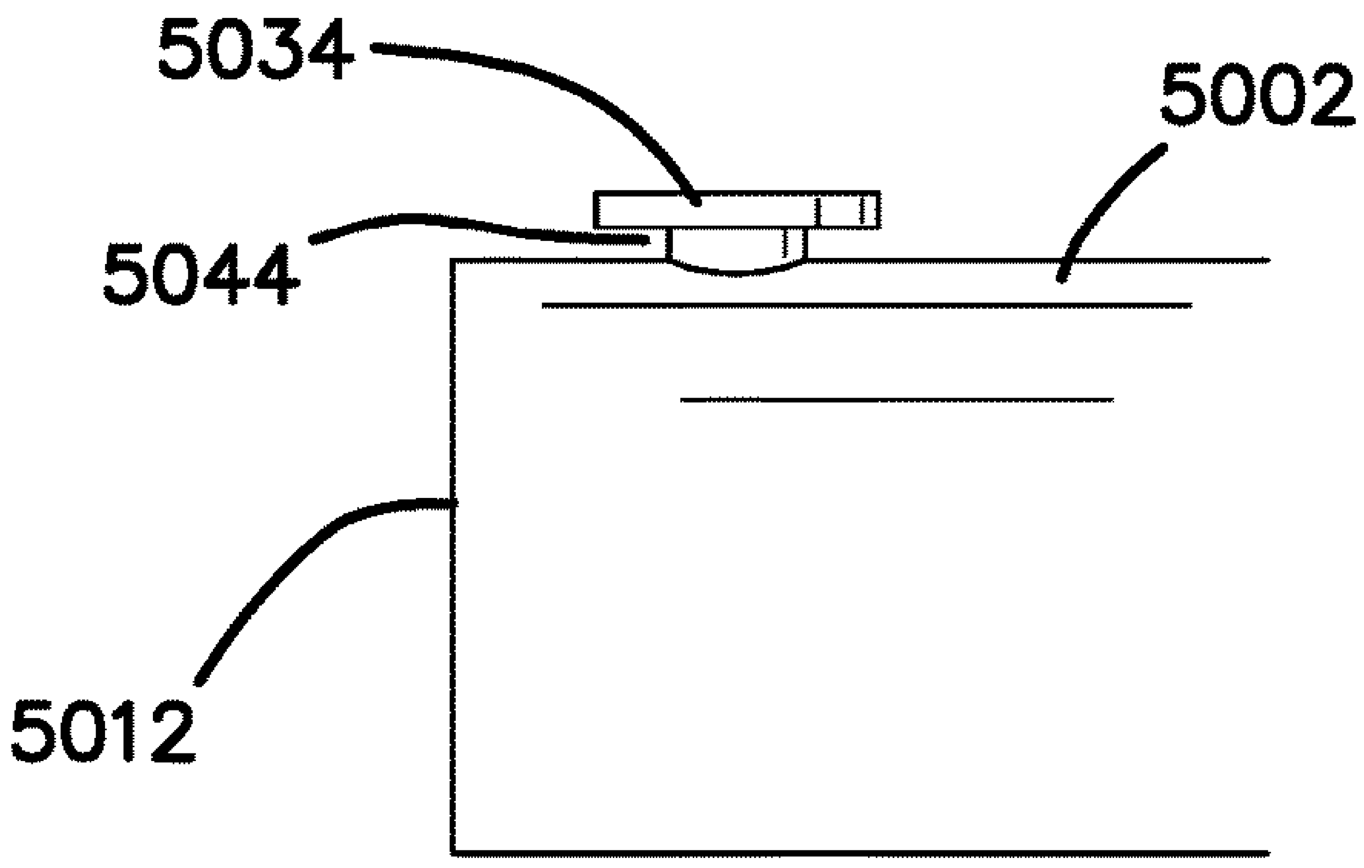


FIG. 173

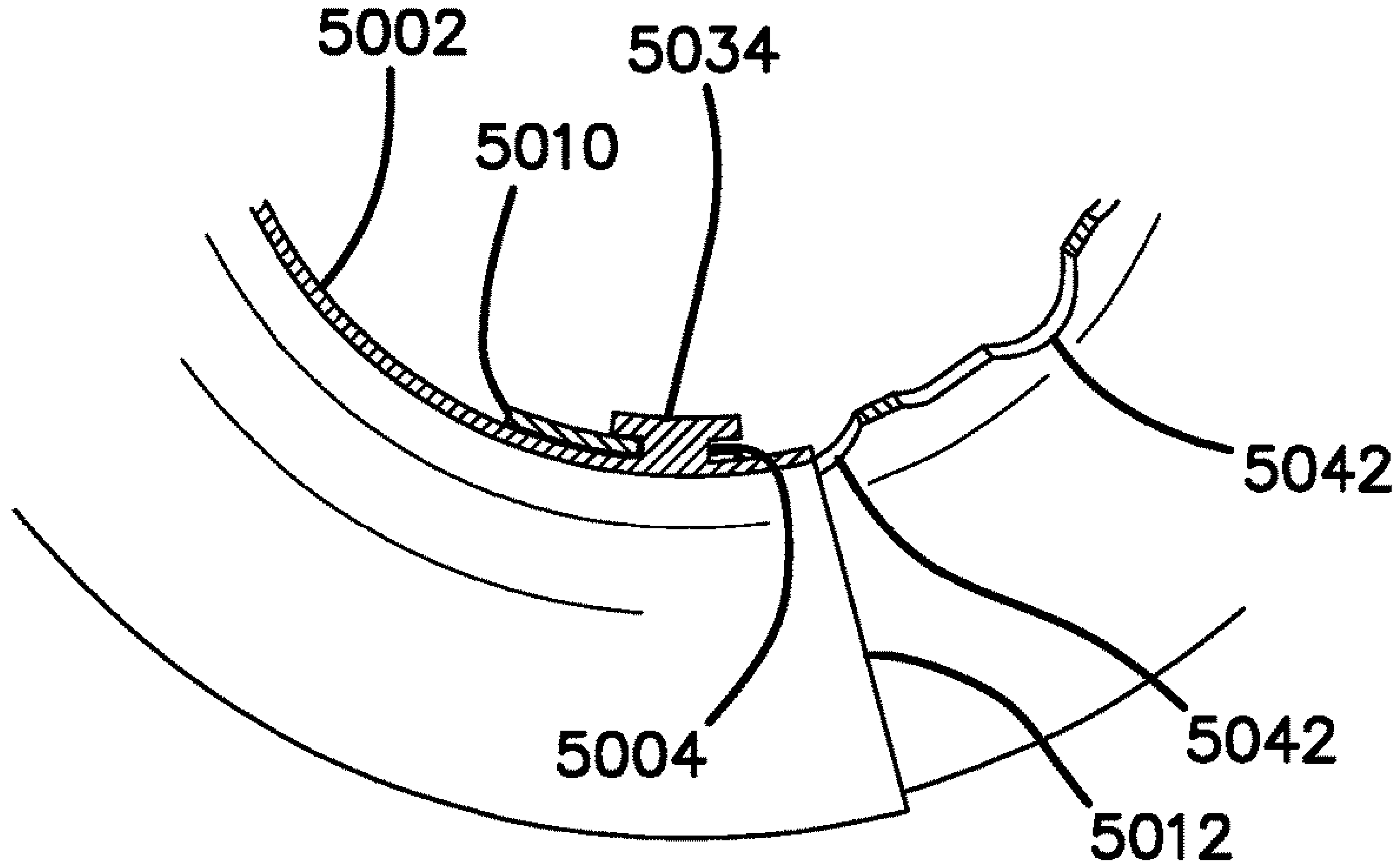


FIG. 174

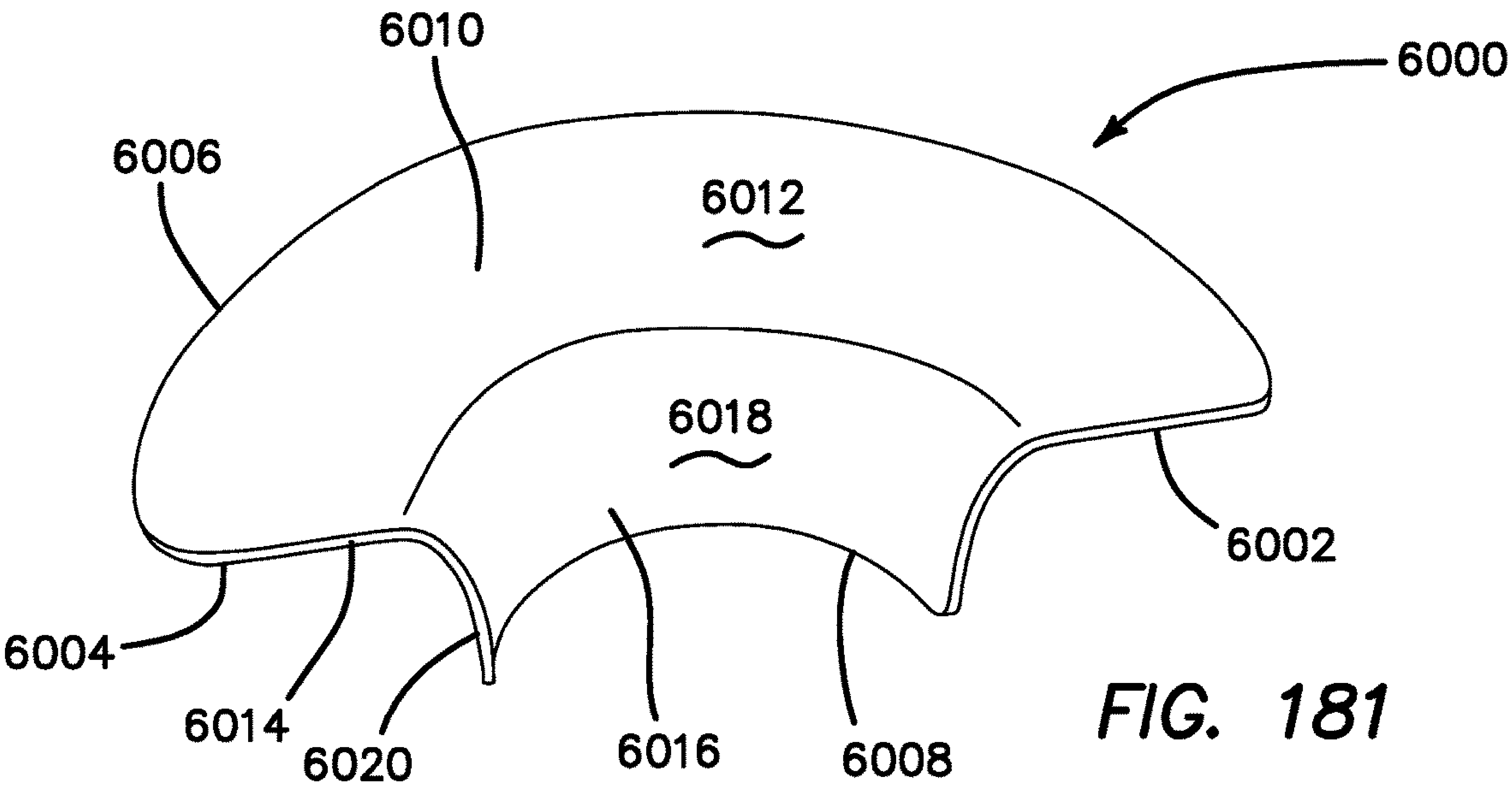


FIG. 181

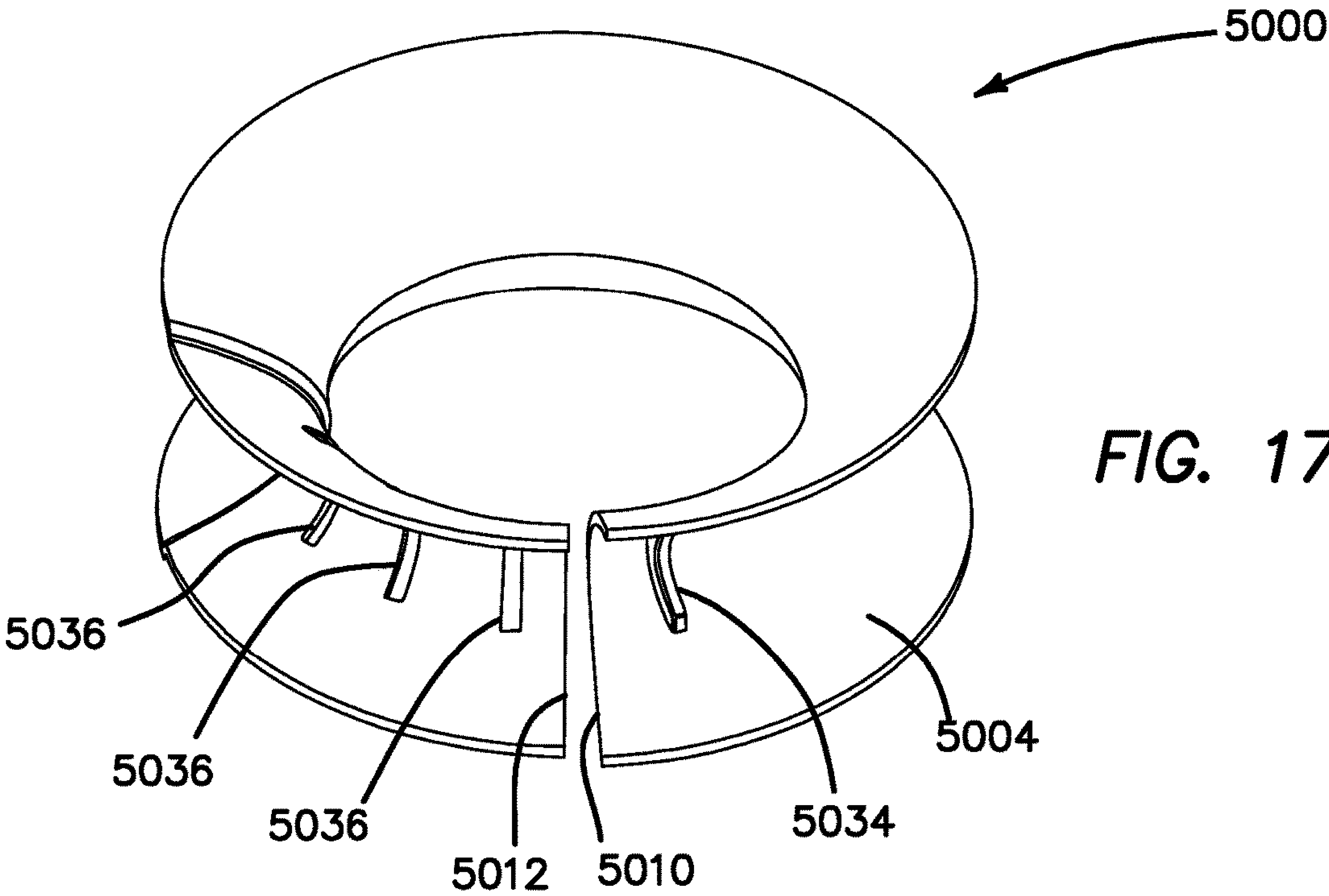


FIG. 175

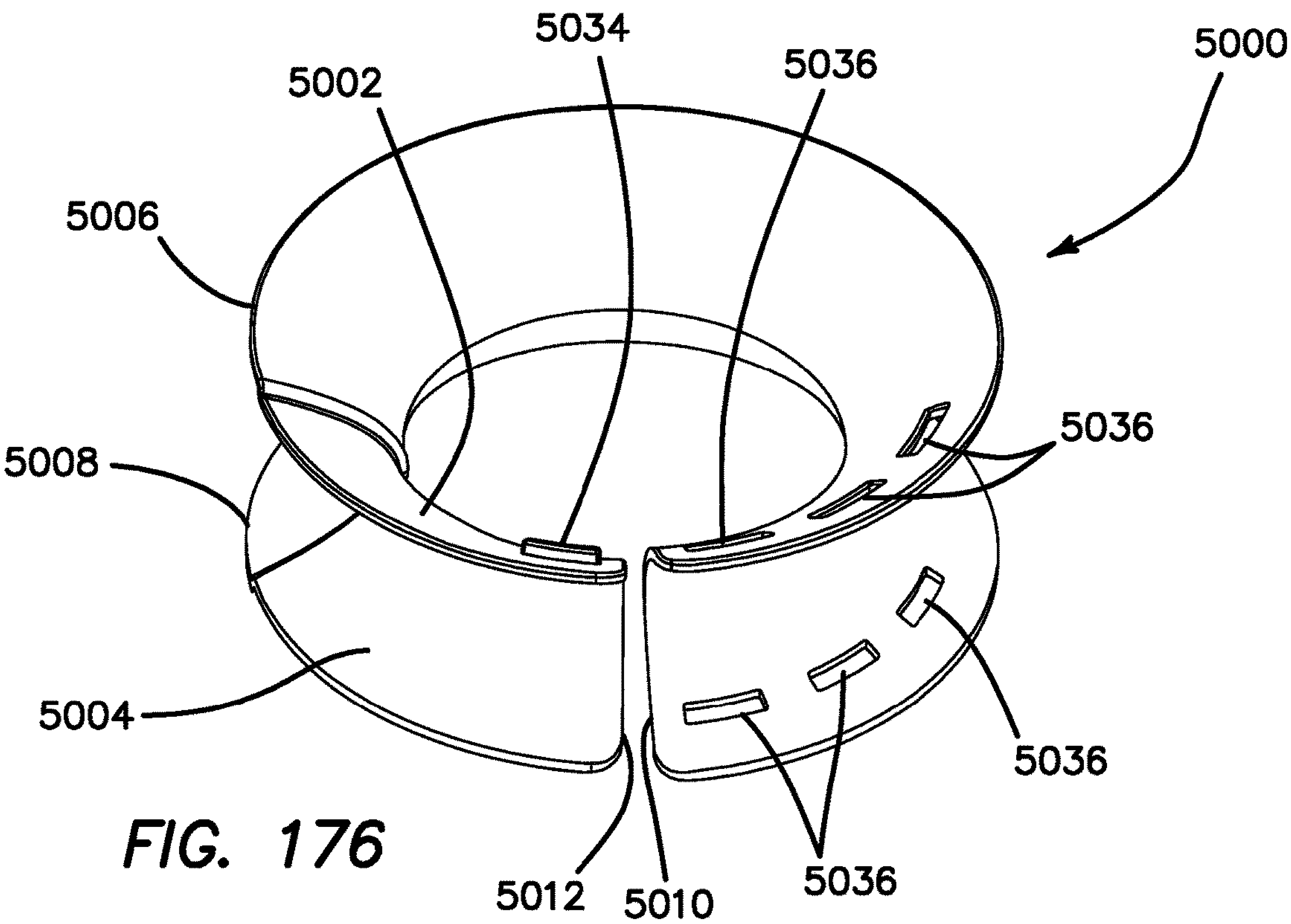


FIG. 176

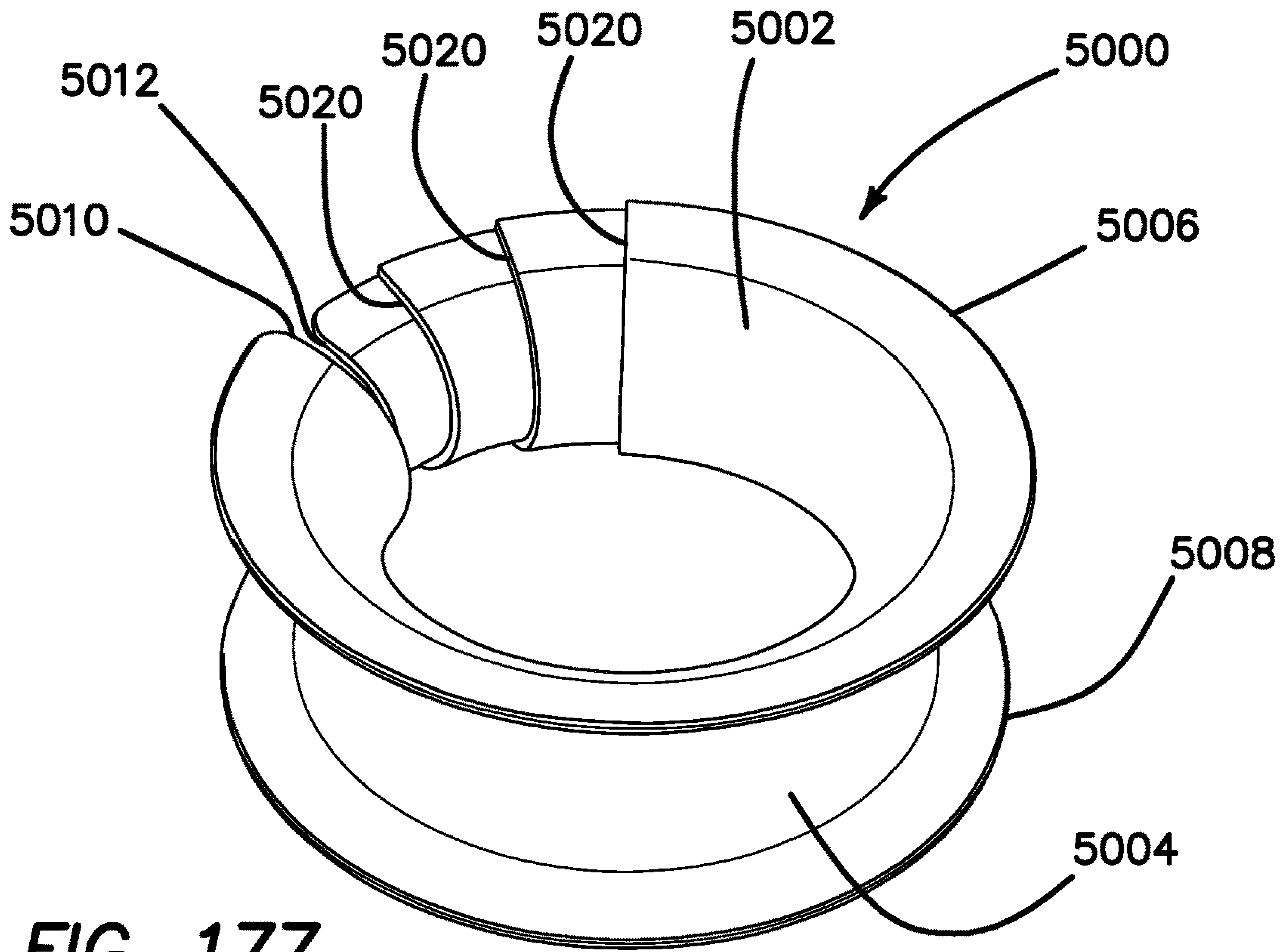


FIG. 177

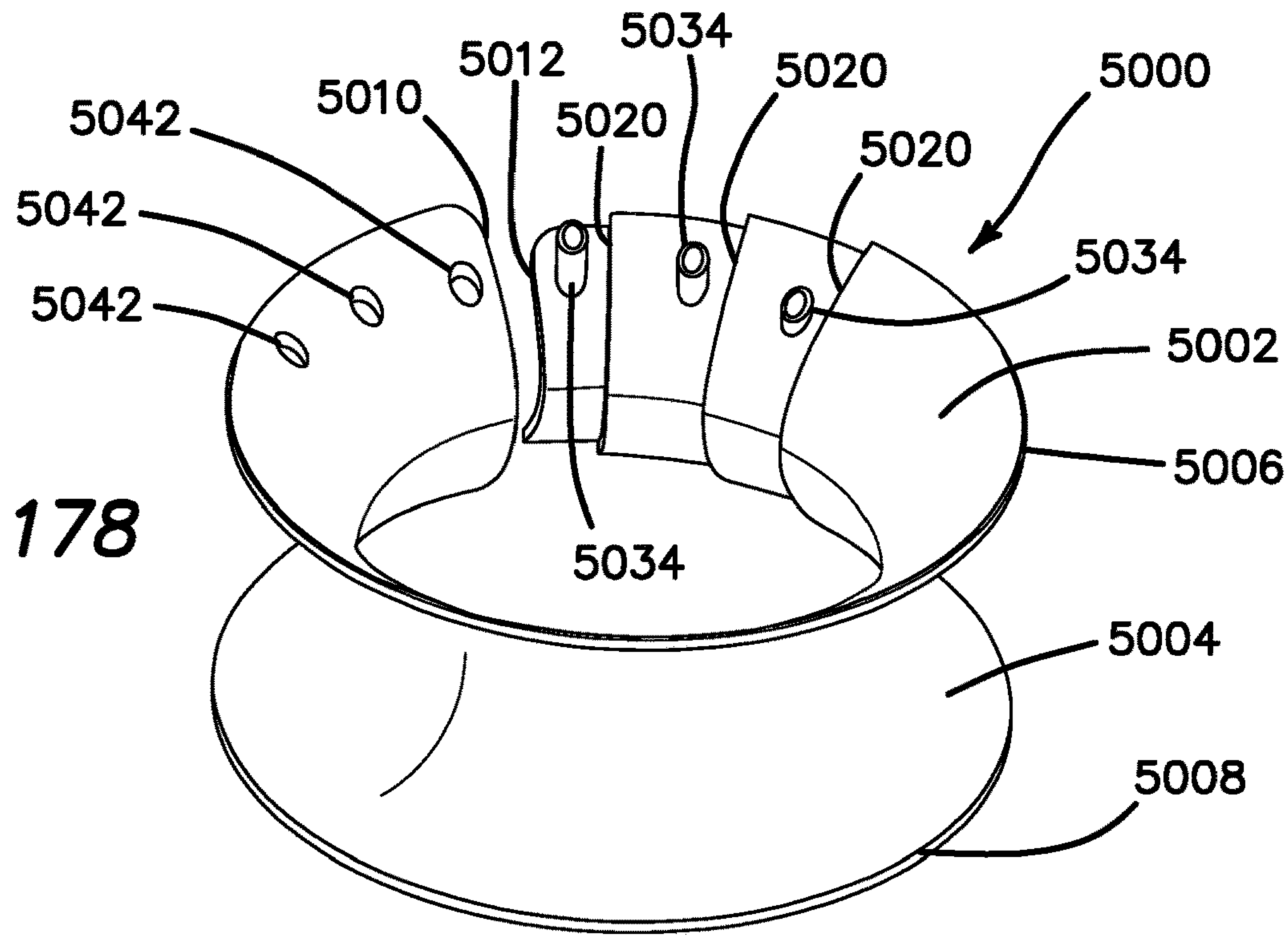
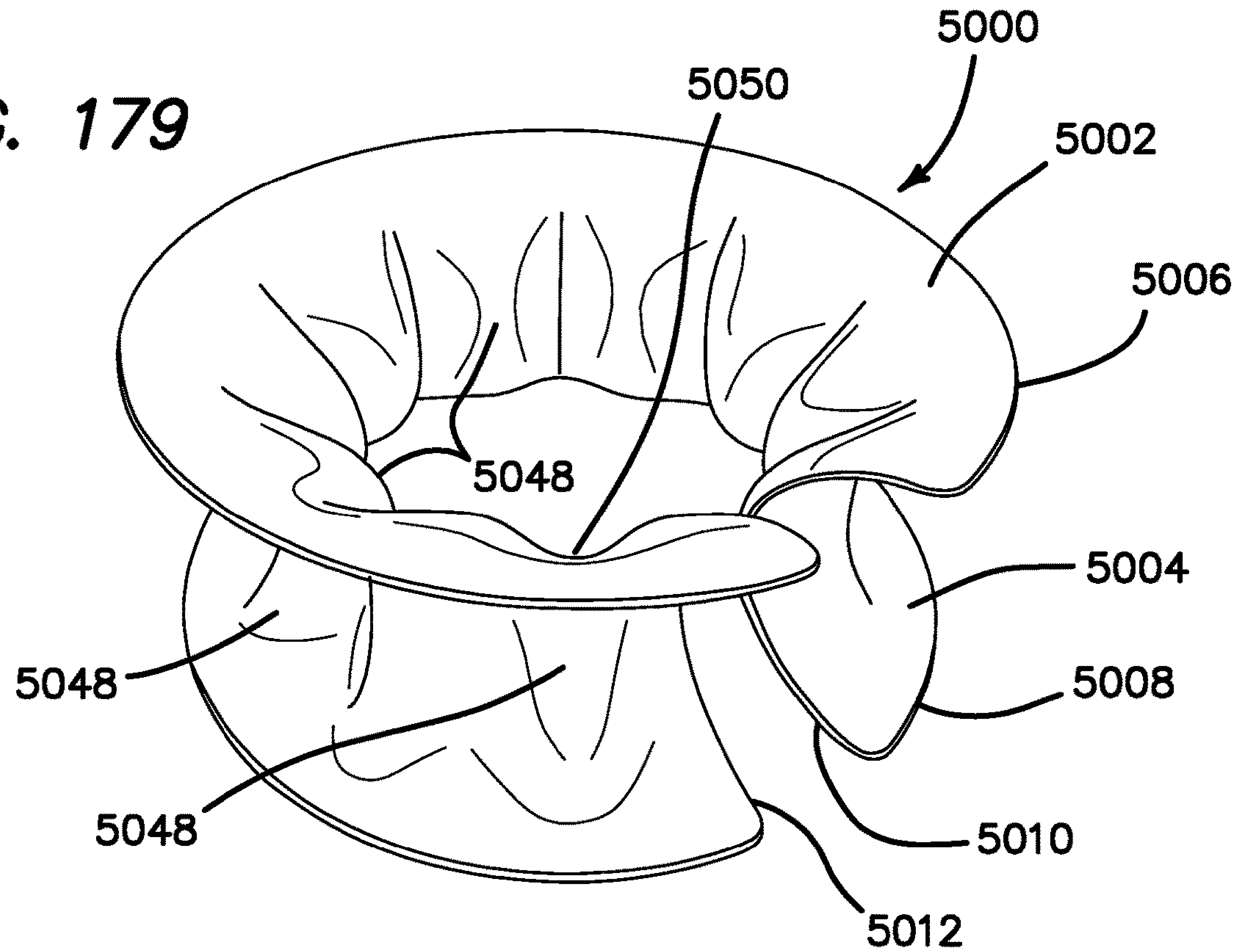


FIG. 178

FIG. 179



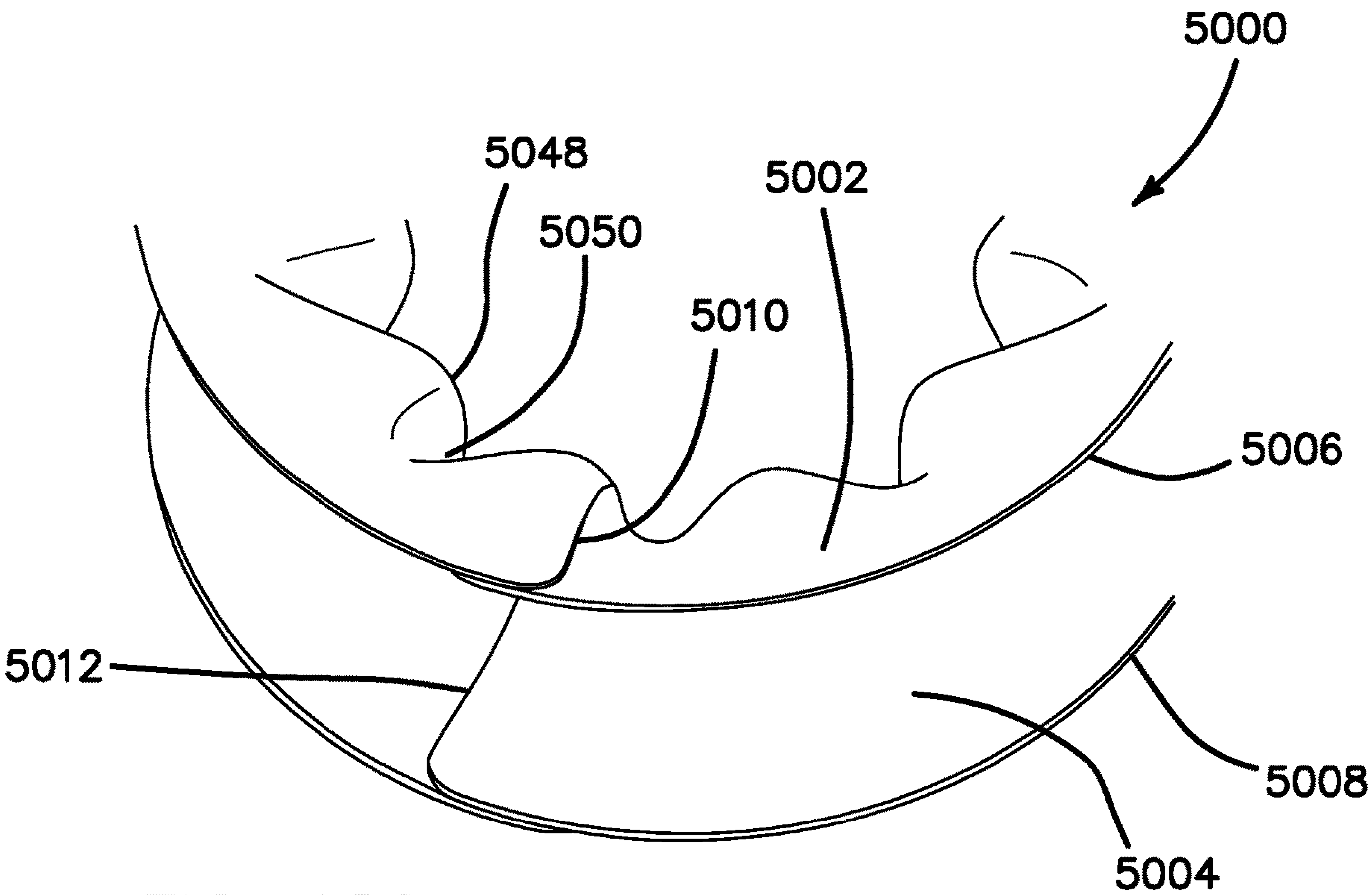


FIG. 180

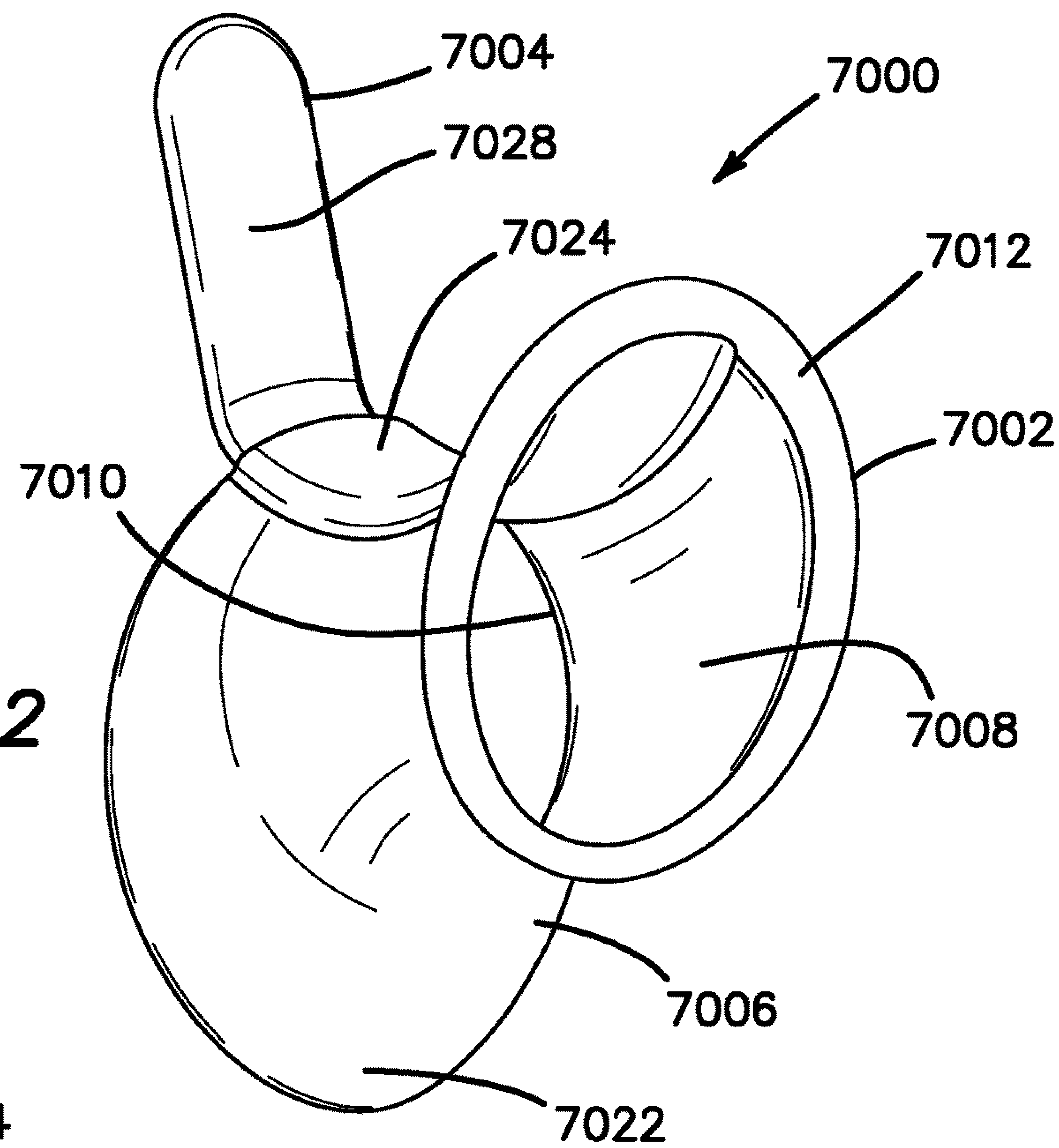


FIG. 182

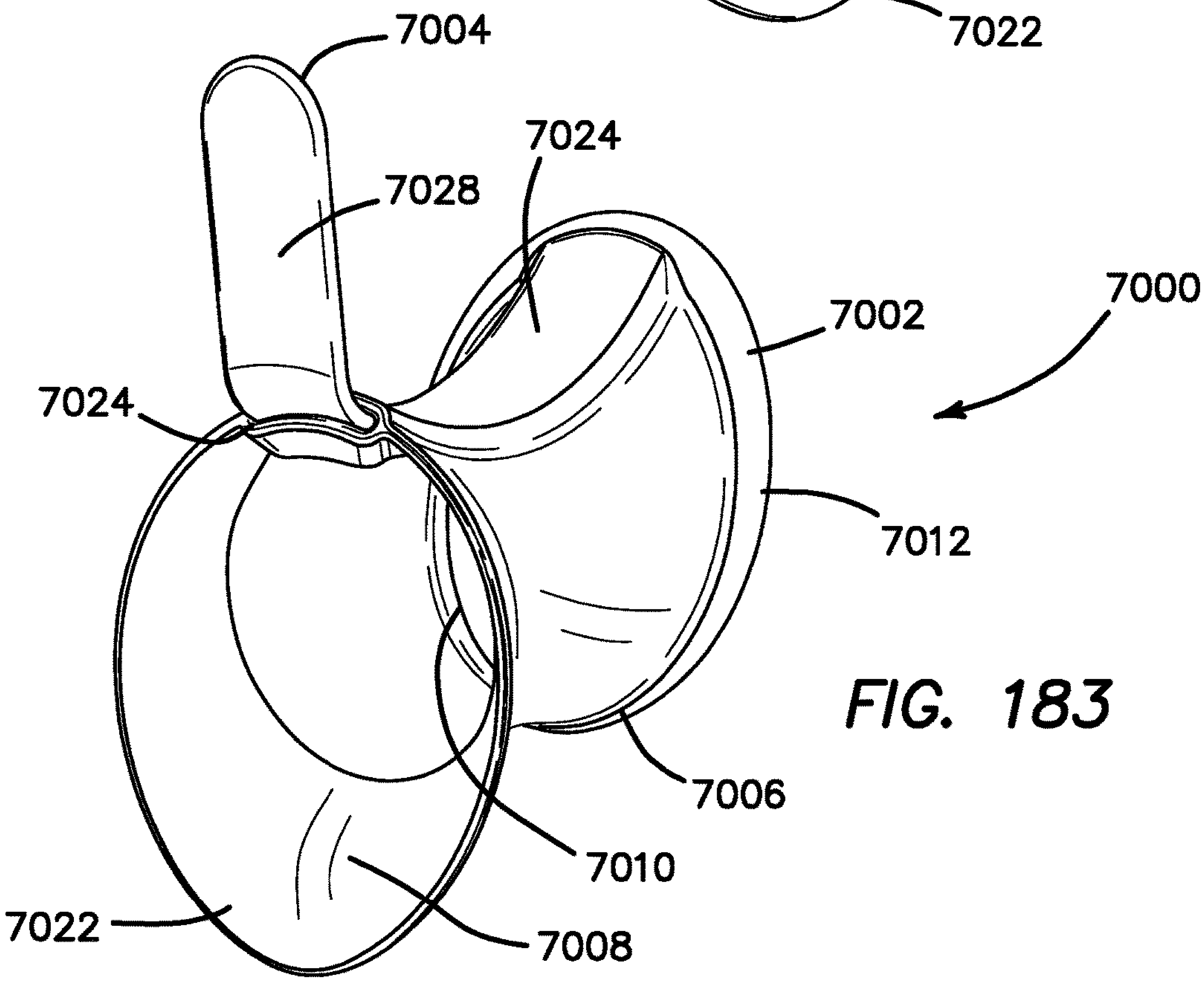


FIG. 183

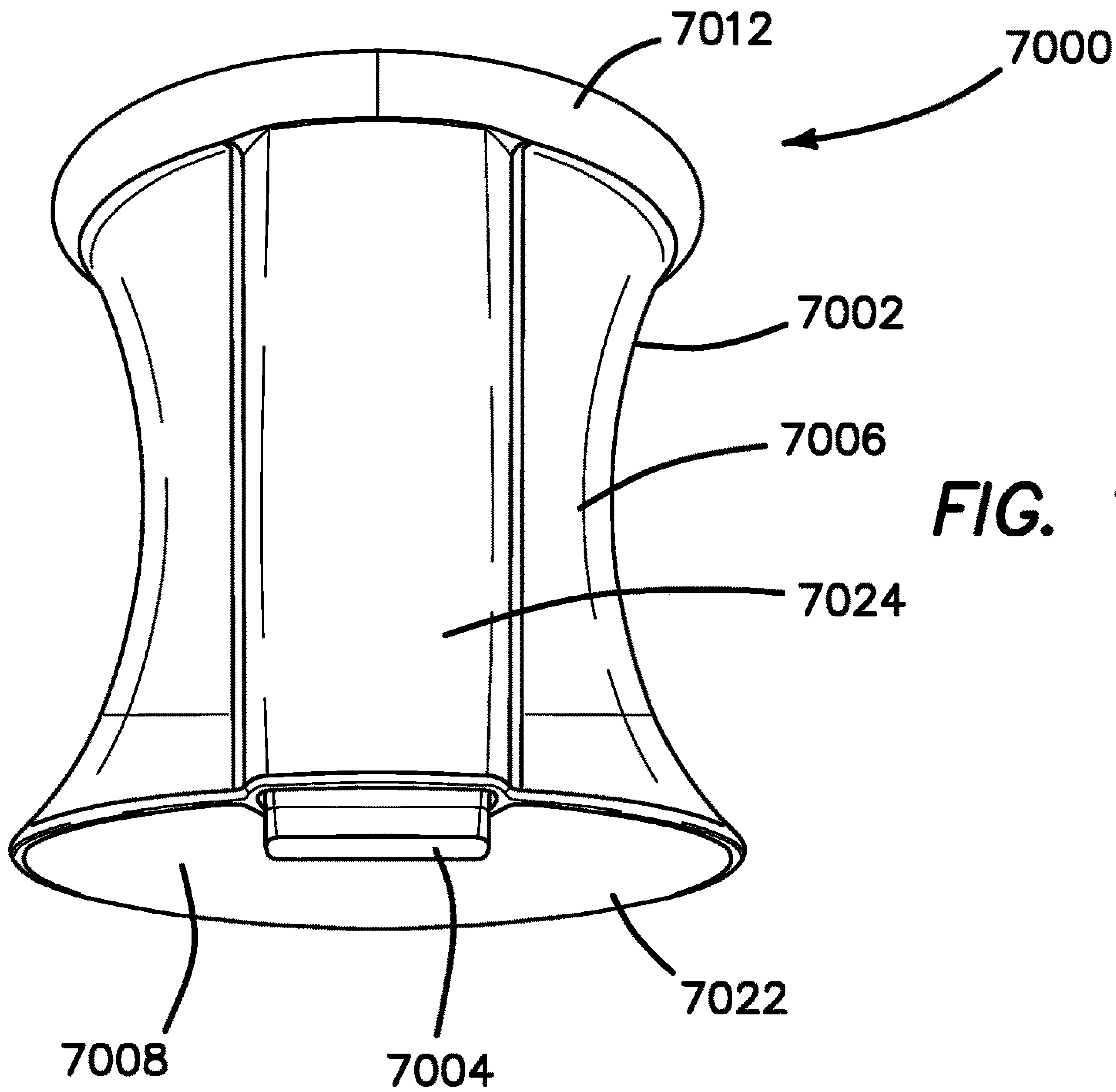


FIG. 184

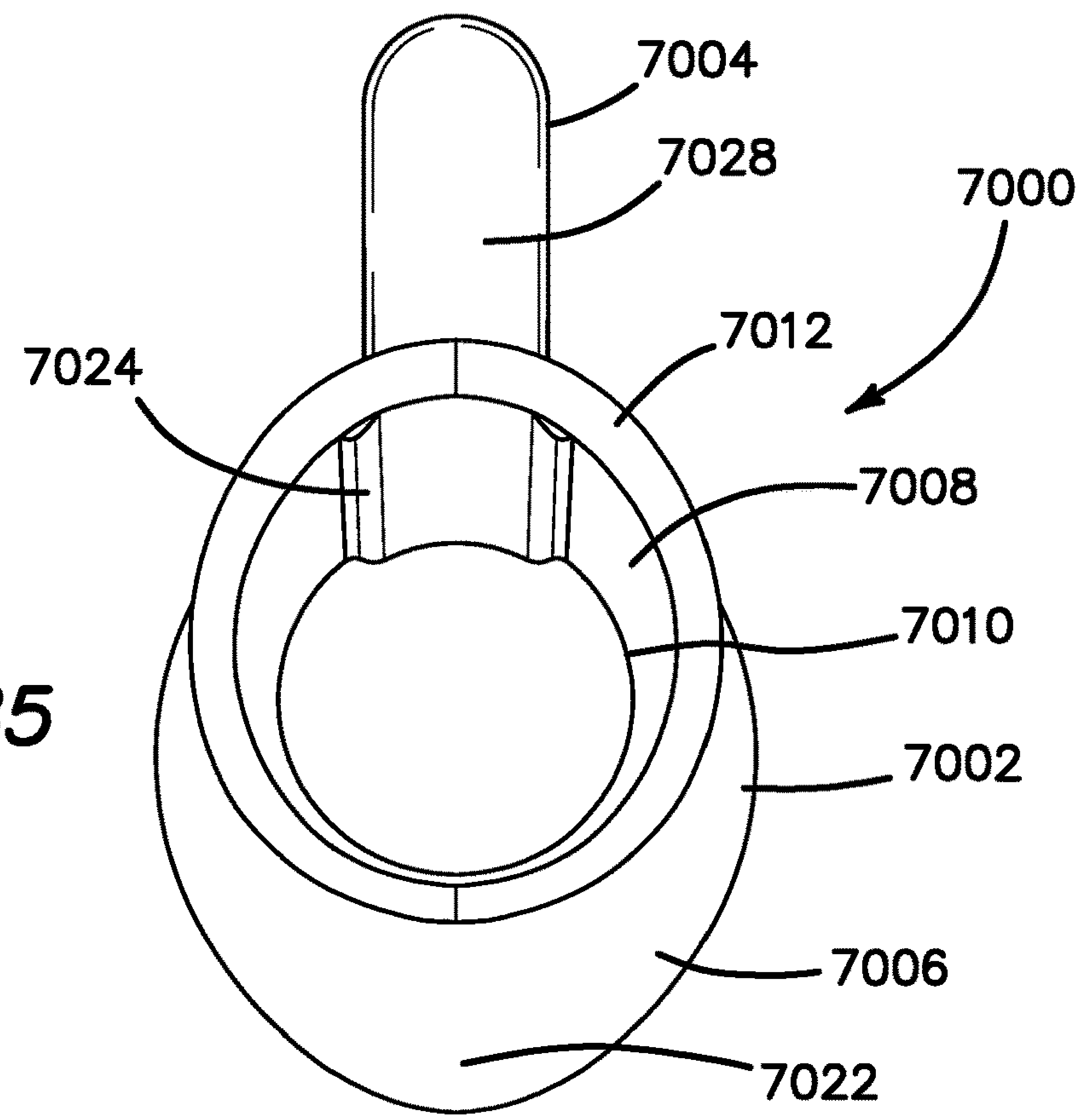


FIG. 185

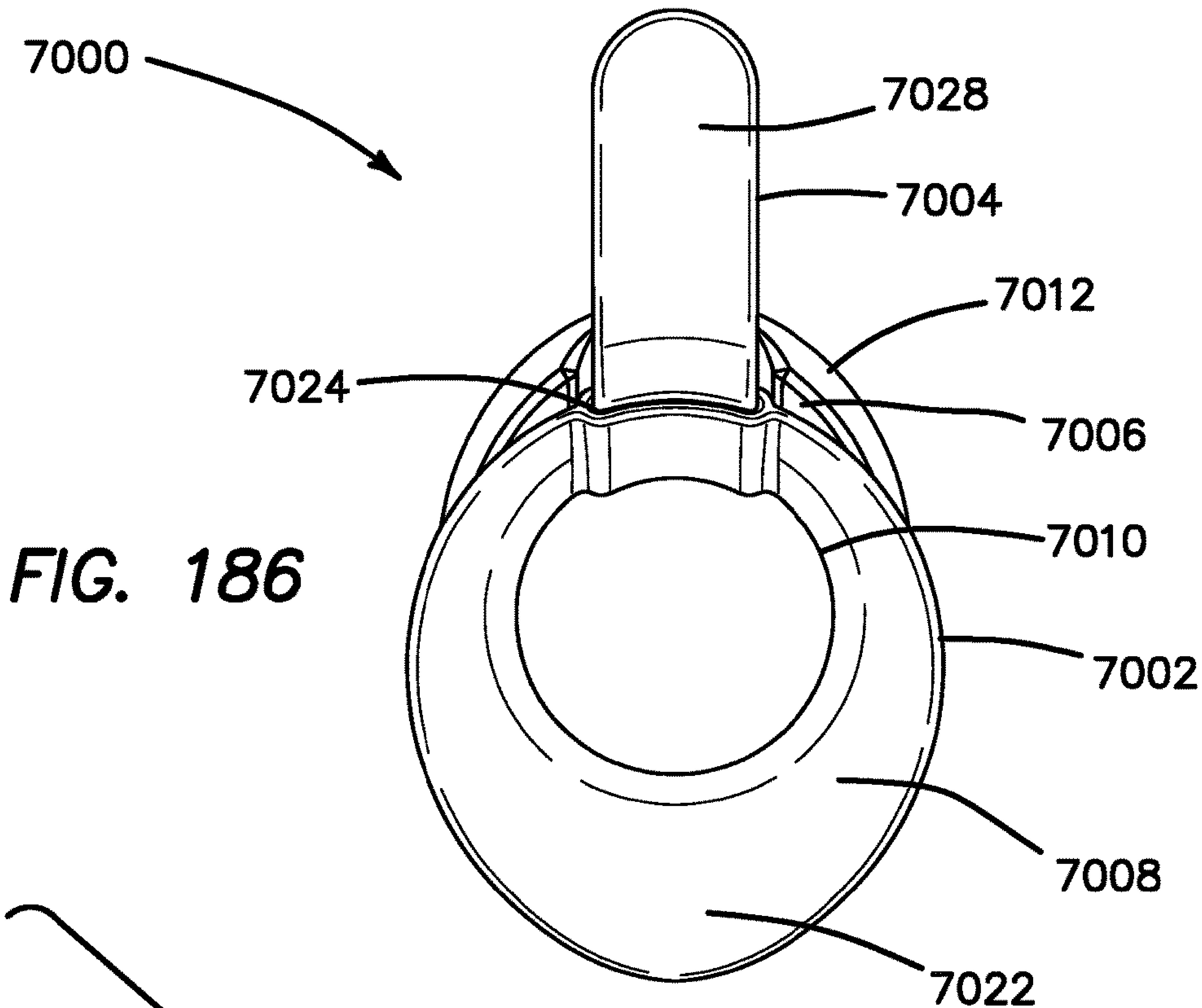


FIG. 186

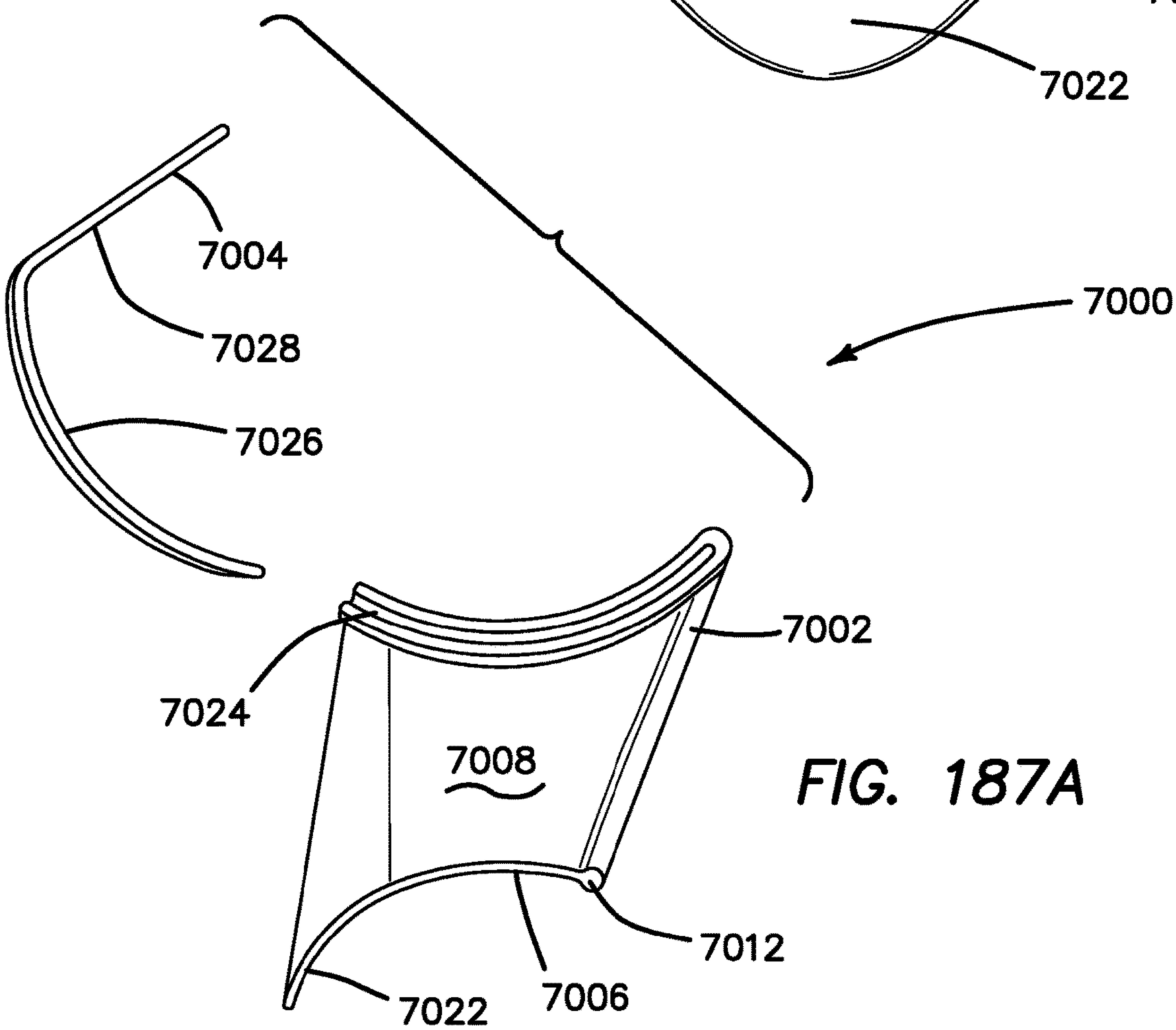


FIG. 187A

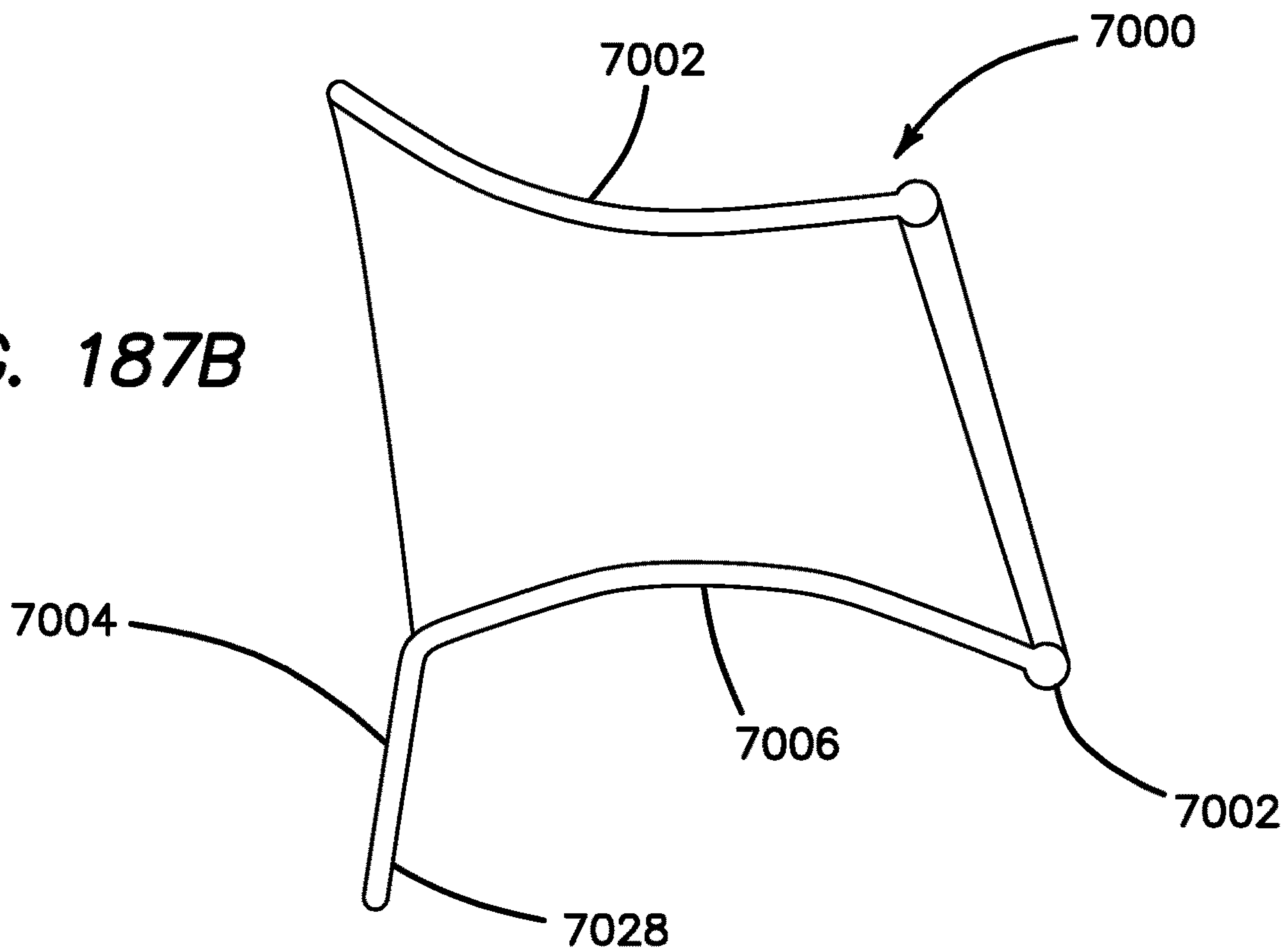


FIG. 187B

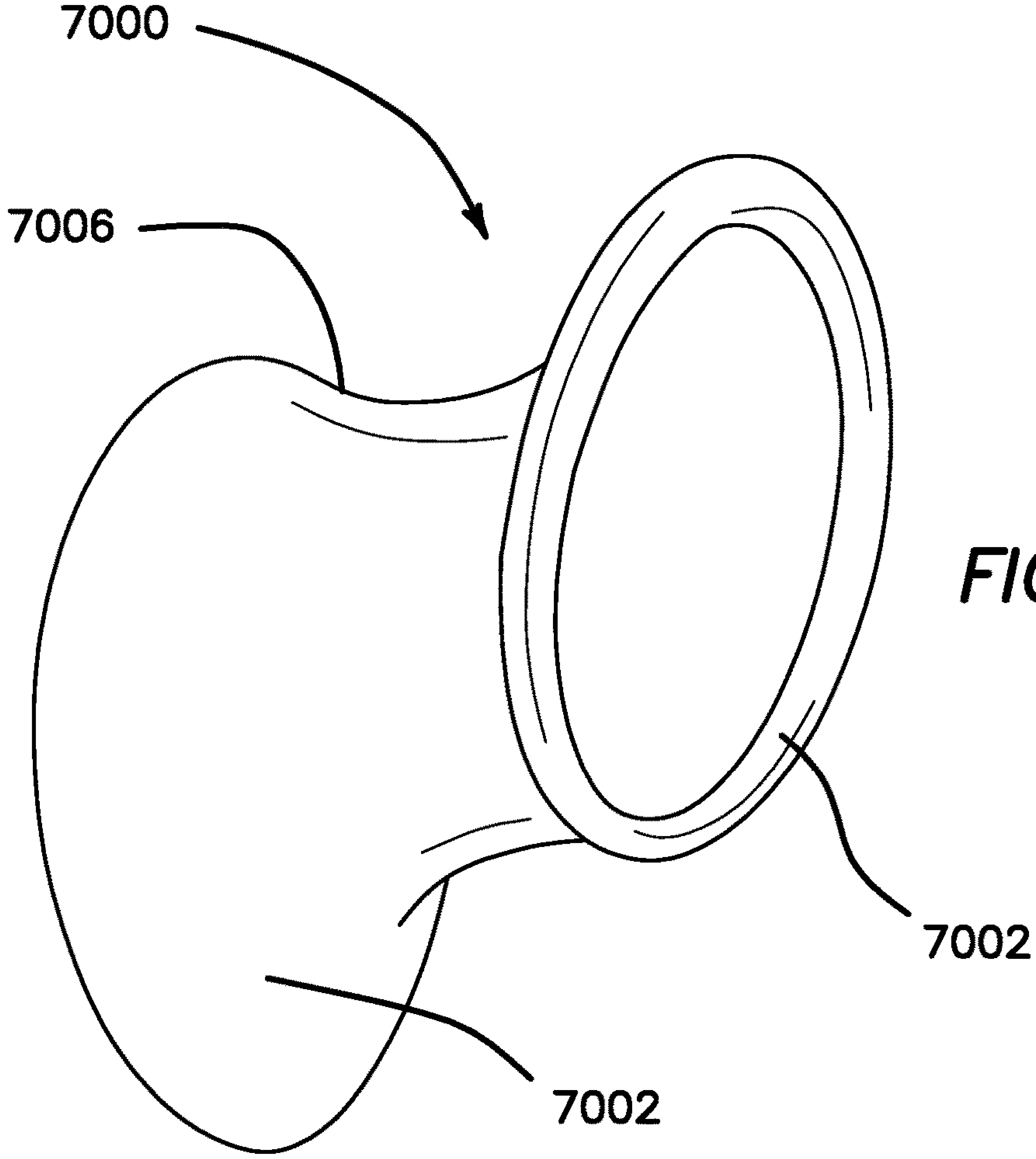


FIG. 187C

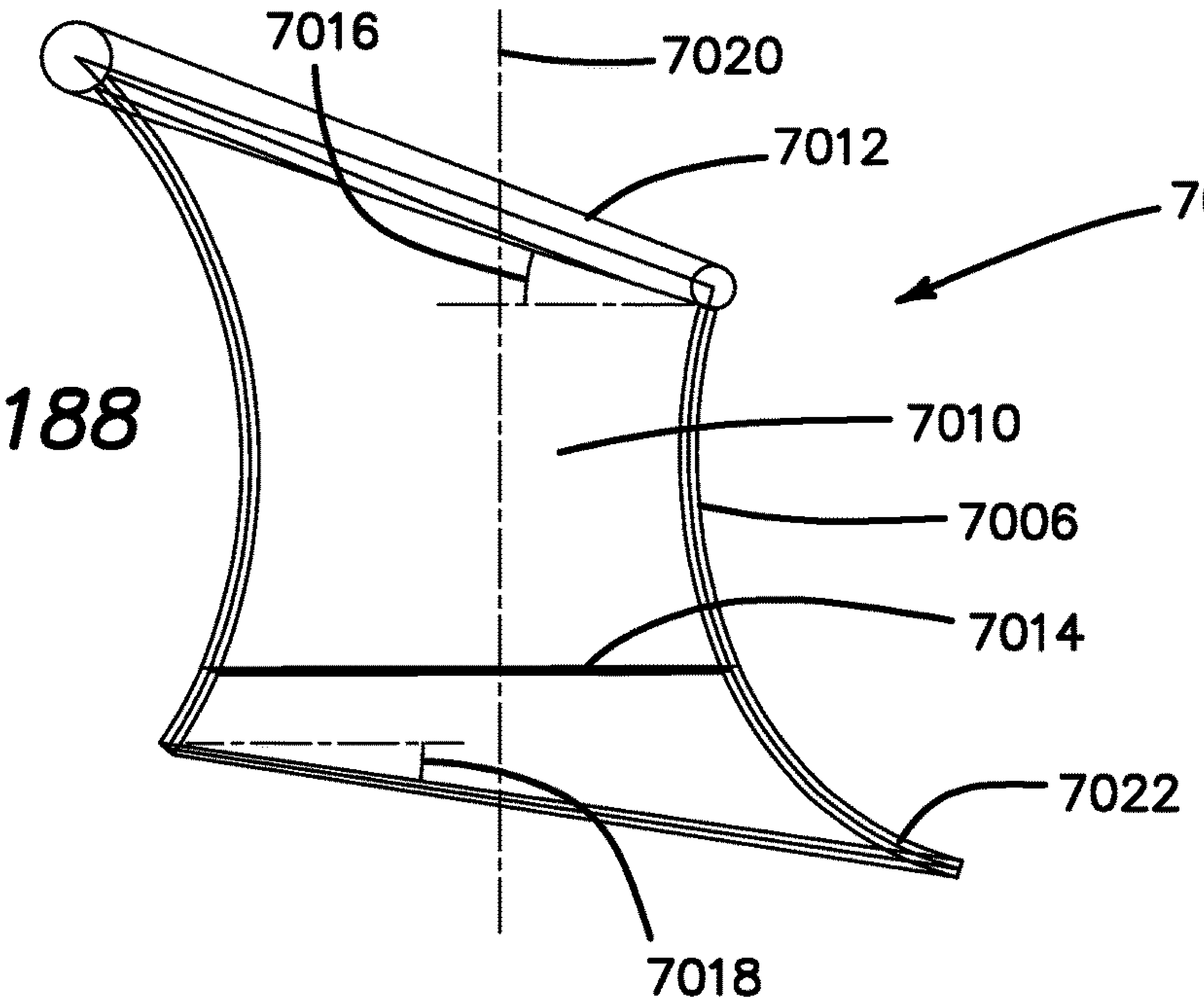
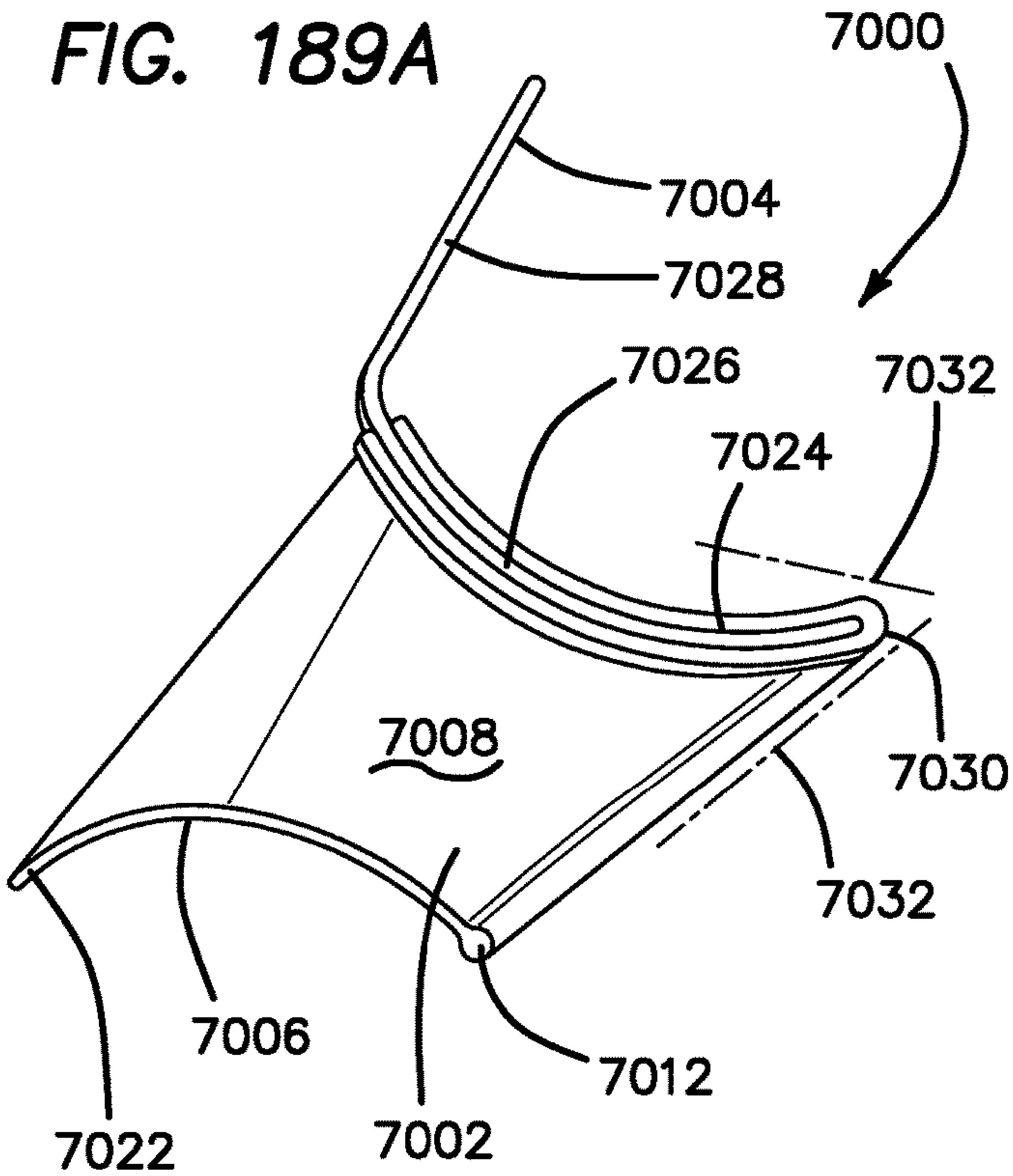


FIG. 188

FIG. 189A



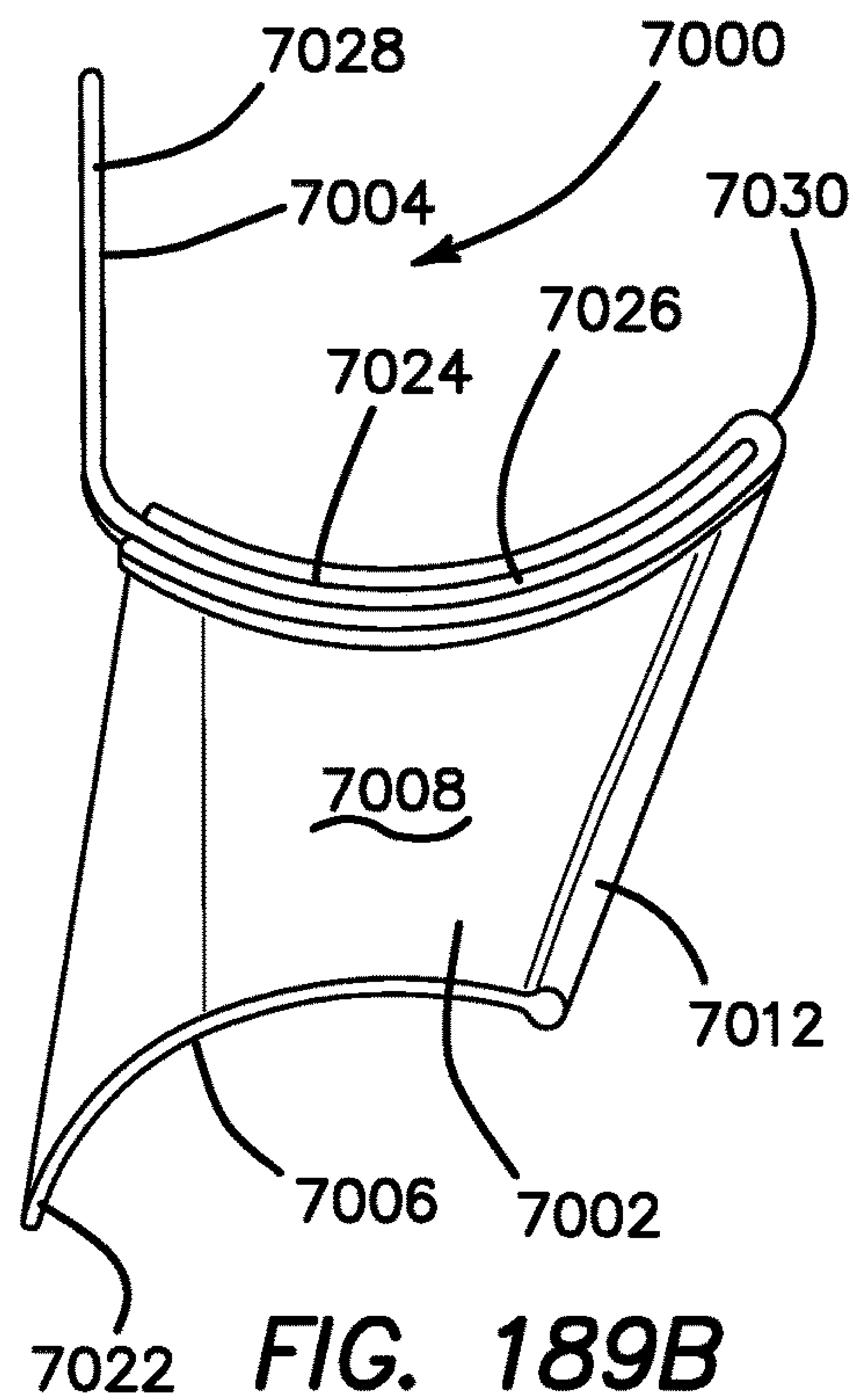


FIG. 189B

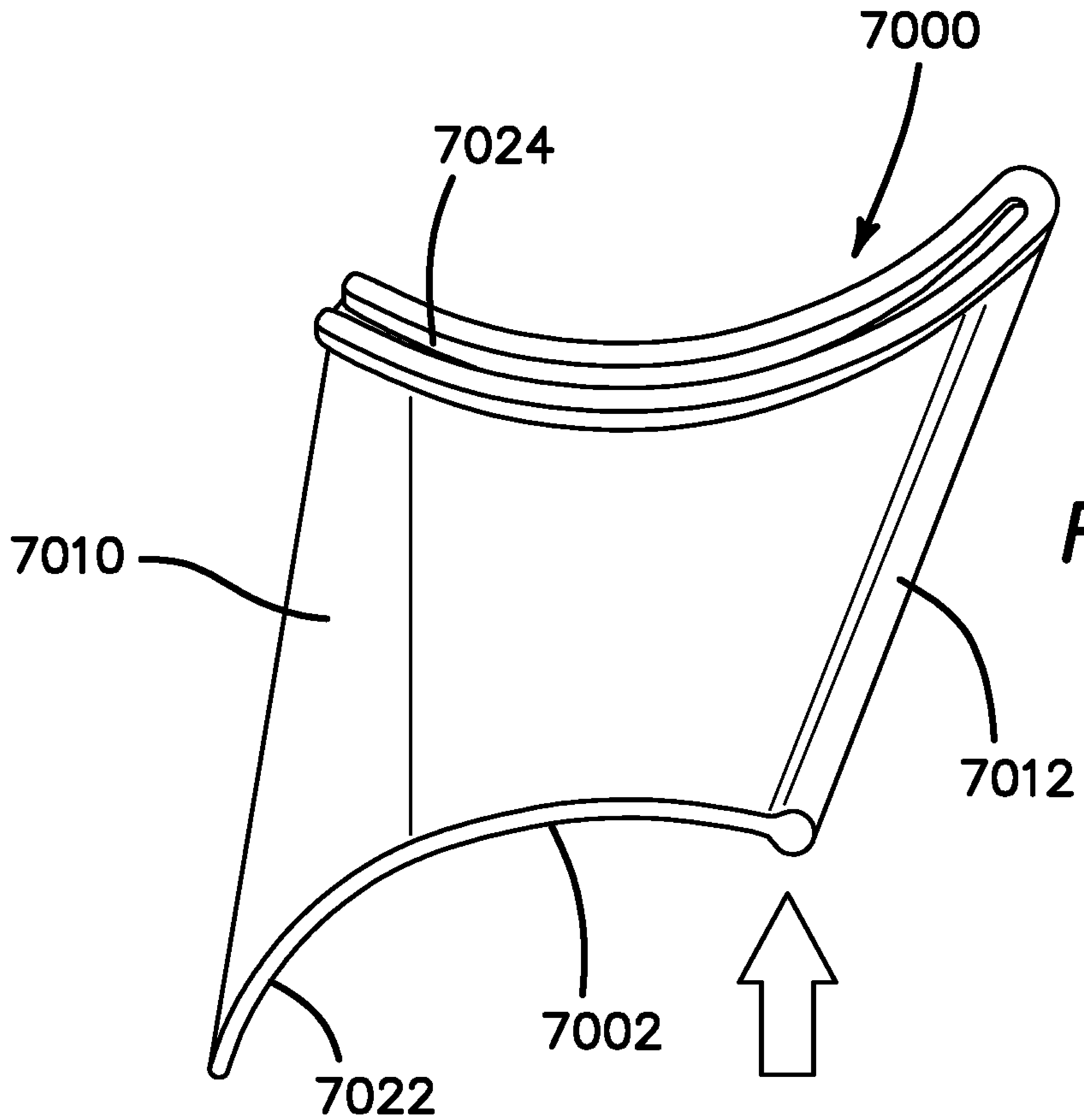


FIG. 190A

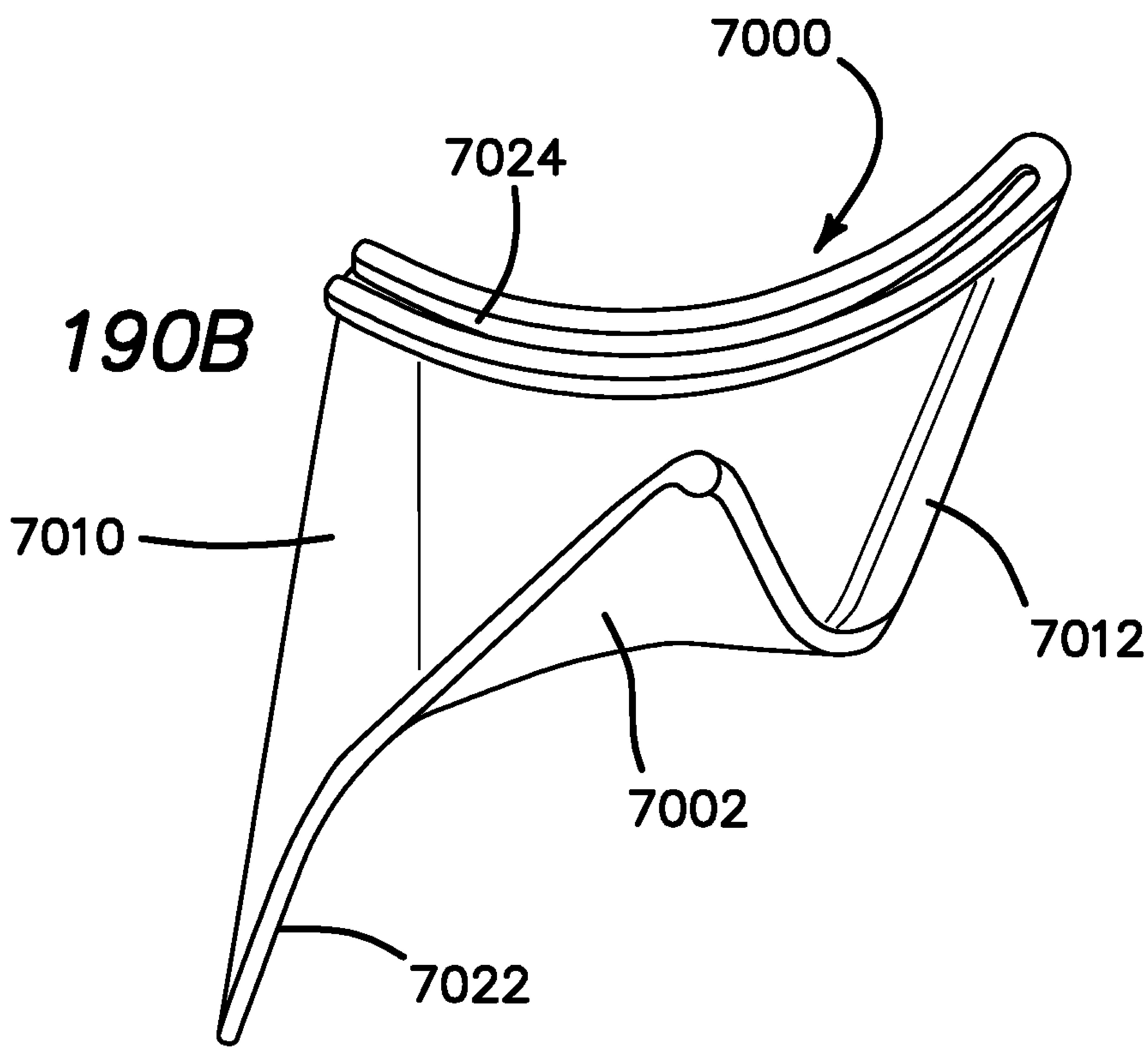


FIG. 190B

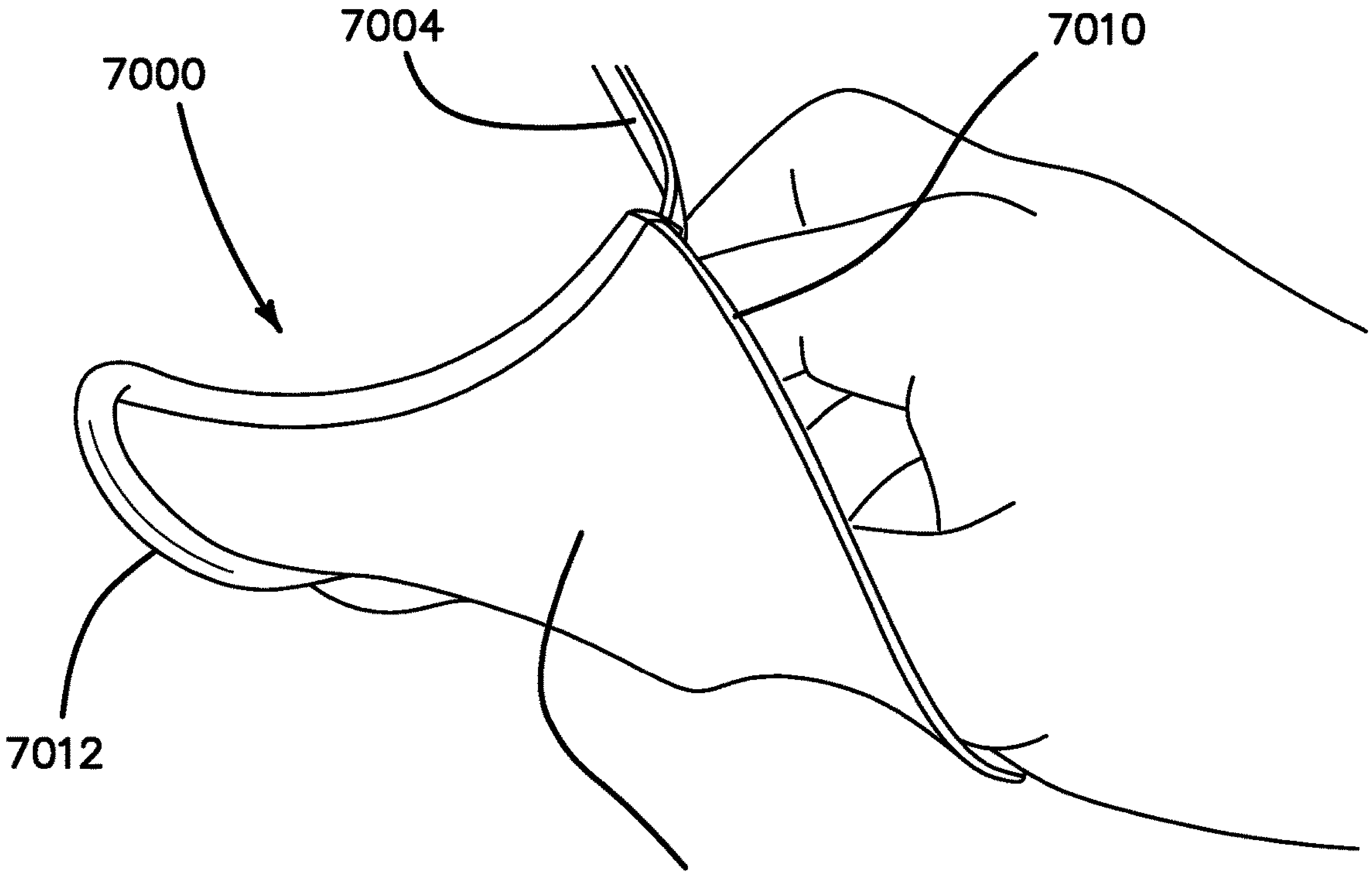


FIG. 190C

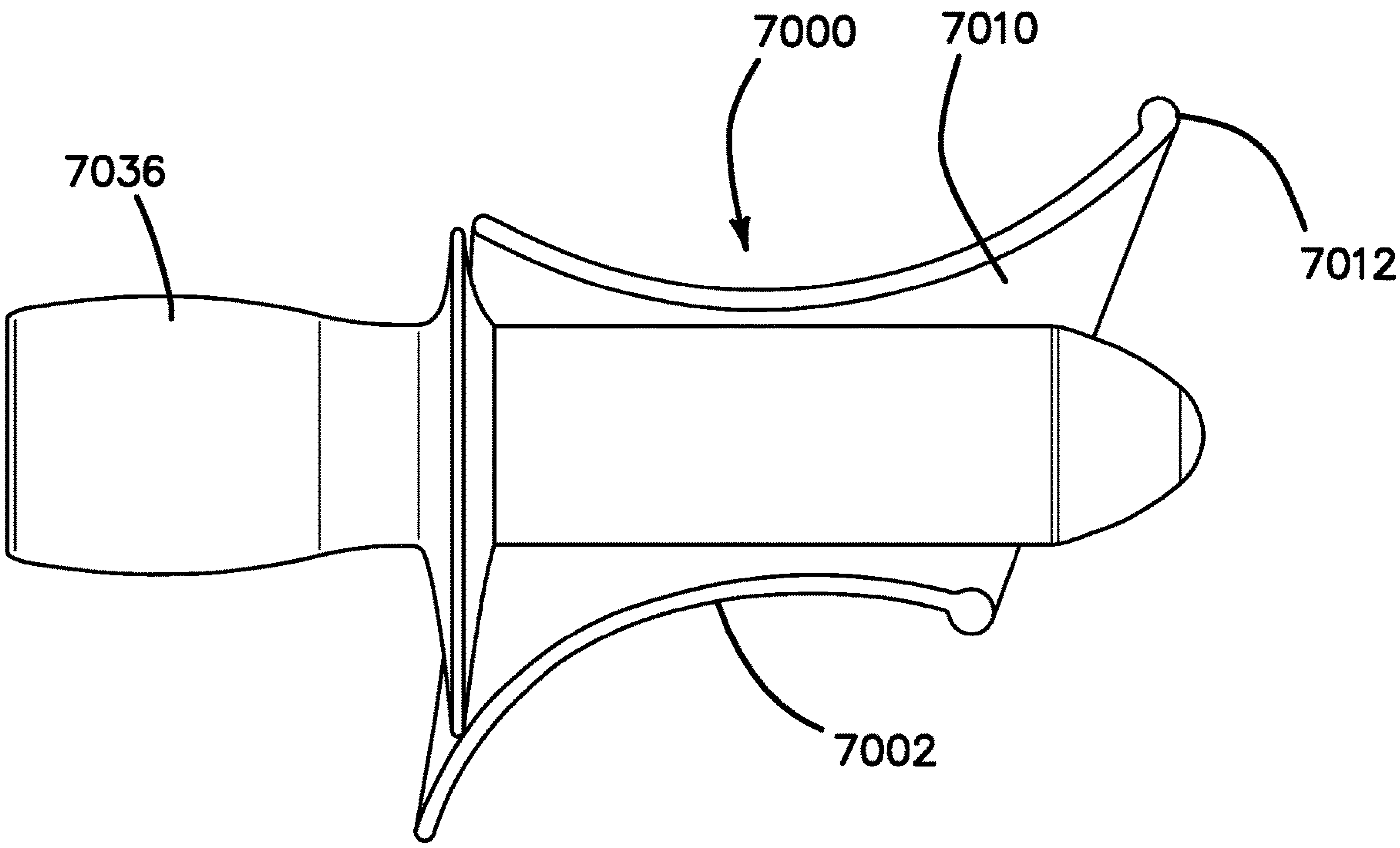


FIG. 190D

SYSTEMS AND METHODS FOR TISSUE REMOVAL

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of International Application No. PCT/US2017/014402 entitled "Systems and methods for tissue removal" filed on Jan. 20, 2017 which claims priority to and benefit of U.S. Provisional Patent Application Ser. No. 62/281,820 entitled "Systems and methods for tissue removal" filed on Jan. 22, 2016 which are hereby incorporated herein by reference in their entireties.

FIELD OF THE INVENTION

This invention relates to medical devices, and in particular, to systems and methods for the removal of tissue through a body opening.

BACKGROUND OF THE INVENTION

Systems and methods for the surgical removal of tissue through body openings including small incision sites and/or body orifices are described. Where needed, a small incision is made in a patient to access surgically targeted tissue located inside a body cavity. Surgically targeted tissue may also be approached through a body orifice without an initial incision. Sometimes the targeted tissue is approached directly through the incision or body orifice. Other times, an access device system is placed and/or positioned into, across, at, and/or within the incision and/or body orifice to retract tissue, enlarge, reshape, and/or isolate the incision or body orifice. The access device system serves as a portal for accessing targeted tissue that is located in or adjacent to the body cavity or body orifice. The targeted tissue is detached from adjacent and surrounding tissue employing known surgical techniques and procedures. Once freed, the targeted tissue is ready for removal through the small incision or body orifice. If the targeted tissue is too large to be removed in whole, then it is reduced in size and removed in parts through the small incision. Ideally, the surgeon will "core" or "peel" the targeted tissue to keep it in one piece as much as possible. However, more likely than not, the targeted tissue will be reduced into multiple pieces.

Reducing the size of the targeted tissue is called morcellation. A morcellation procedure includes cutting the targeted tissue into smaller pieces manually with a scalpel or knife, for example, or employing a power morcellator to cut the targeted tissue so that it is removable through the small incision. Pieces of the targeted tissue are removed from the patient through the small incision. As the targeted tissue is being reduced in size in order to fit through the small incision, small pieces of tissue may be cut off and left behind in the patient. As such, morcellation is contraindicated in cases of malignancy or endometriosis. If cancer is morcellated, it can spread malignant tissue and upstage cancer and increase patient mortality.

A hysterectomy is an example of a surgical procedure that may involve morcellation. More than 500,000 hysterectomies are performed annually on women in the United States. Common reasons that a woman may have a hysterectomy are the presence of fibroids, cancer, endometriosis or prolapse. Of these hysterectomies, about 200,000 are performed laparoscopically. When the uterus is too large (>300 g) to be removed through the vagina or if the cervix is still in place, the specimen must be reduced in size to be removed through

an abdominal incision or through the vagina. During myomectomy (fibroid removal), large fibroids may also need to be extracted using a morcellation procedure. During morcellation, the targeted tissue (usually a uterus and sometimes adnexal structures) is brought to the abdominal wall surface such as with a tissue grasper and is reduced in size using a blade and removed through the incision from the pelvic cavity. In another variation, the targeted tissue is removed through a body orifice such as through the vagina. Fibroids, or uterine leiomyoma, account for about 30-40% of hysterectomies. These are benign tumors of the uterus that can lead to heavy and painful bleeding. In the past there has been a mild concern that these tumors could be undetected cancer, or Leiomyosarcoma, and it was believed to affect about 1 in 10,000 women. More recent data has come out to support a much higher risk of undetected malignancy in these tumors, putting the range at 1:1000 to 1:400. Because of this elevated risk, many surgeons have begun changing their technique to try to enclose the specimen to do a closed morcellation process by morcellating in a bag to contain errant pieces and prevent dispersion and seeding of tumor cells, rather than morcellating without a bag in a process called open morcellation. Many GYN societies, including AAGL, ACOG, and SGO, have released statements warning of the potential danger of open morcellation. On Apr. 17 2014, the FDA issued a statement discouraging the use of open power morcellation for hysterectomies and myomectomies for women undergoing these procedures for fibroids. The FDA also increased their estimated of malignant likelihood to 1 in 350. For these reasons, systems and methods are needed to safely and effectively reduce tissue specimens. The present invention sets forth such safe systems and methods for both manual morcellation and power morcellation performed in a closed system.

SUMMARY OF THE INVENTION

According to one aspect of the invention, a surgical shield for insertion into and protection of an orifice of a patient is provided. The surgical shield includes a guard portion formed of cut-resistant material into a generally tubular shape. The guard portion has an inner surface and an outer surface that defines a thickness therebetween. A lumen extends along a longitudinal axis between a proximal opening at a proximal end and a distal opening at a distal end of the shield. The shield further includes a batten having reinforcing portion connected to a handle portion. The reinforcing portion is connected to the guard portion and extends along the longitudinal axis of the guard portion. The handle portion is located at the proximal end of the guard portion and extends away from the proximal end of the guard portion to facilitate insertion of the shield.

According to another aspect of the invention, a surgical shield for insertion into and protection of an orifice of a patient is provided. The surgical shield includes a guard portion having an enlarged state and a reduced state. The guard portion is made of cut-resistant, flexible material that is biased to return to the enlarged state when deflect. The guard portion is generally tubular in shape and defines a lumen extending along a longitudinal axis between a proximal opening at the proximal end and a distal opening at the distal end. The guard portion has a lateral axis perpendicular to the longitudinal axis. The distal opening lies in a distal plane that is angled with respect to the longitudinal axis to create a distal insertion wedge at the distal end to facilitate insertion of the shield into an orifice of the patient.

According to another aspect of the invention, a method is provided. The method includes the step of providing a shield having a guard portion that has an enlarged state and a reduced state. The guard portion is made of flexible material that is biased to return to the enlarged state. The guard portion is generally tubular in shape and defines a lumen extending along a longitudinal axis between a proximal opening at a proximal end and a distal opening at a distal end. The method includes the steps of arranging the guard portion into a reduced state, inserting the shield into an orifice of a patient while in a reduced state, and releasing the shield from the reduced state such that it expands toward the enlarged state against the orifice.

According to another aspect of the invention, a method is provided. The method includes the step of providing a shield having a guard portion that is made of flexible, cut-resistant material. The guard portion is generally tubular in shape and defines a lumen extending along a longitudinal axis between a proximal opening at a proximal end and a distal opening at a distal end. The shield includes a batten removably connected to the guard portion. The batten is relatively more rigid than the guard portion. The batten has a reinforcing portion connected to a handle portion. The reinforcing portion is connected to the guard portion such that it extends along the longitudinal axis of the guard portion. The handle portion is located at the proximal end of the guard portion and extends away from the proximal end of the guard portion. The method includes the steps of connecting the batten to the guard portion and inserting the shield into an orifice of a patient while the batten is connected to the guard portion.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a cross-sectional view of a containment bag and guard placed in an opening in a body wall according to the present invention.

FIG. **2** is a top perspective view of a guard according to the present invention.

FIG. **3** is a side view of a guard according to the present invention.

FIG. **4** is an end view of a guard according to the present invention.

FIG. **5** is a cross-sectional view taken along line **5-5** of FIG. **4** of a guard according to the present invention.

FIG. **6** is a cross-sectional view taken along **6-6** of FIG. **4** of a guard according to the present invention.

FIG. **7** is a top perspective view of a guard according to the present invention.

FIG. **8** is a side view of a guard according to the present invention.

FIG. **9** is an end view of a guard according to the present invention.

FIG. **10** is a cross-sectional view taken along line **10-10** of FIG. **9** of a guard according to the present invention.

FIG. **11** is a top perspective view of a cap according to the present invention.

FIG. **12** is a cross-sectional side view of a cap and guard according to the present invention.

FIG. **13** is a side view of a cap and guard according to the present invention.

FIG. **14** is a top perspective view of a cap and guard according to the present invention.

FIG. **15** is a top perspective view of a guard according to the present invention.

FIG. **16** is a top perspective view of a guard according to the present invention.

FIG. **17** is a cross-sectional side view of a guard according to the present invention.

FIG. **18** is a top perspective view of a retractor according to the present invention.

FIG. **19** is a top perspective view of a retractor according to the present invention.

FIG. **20**A is a top perspective view of a containment bag and retractor combination according to the present invention.

FIG. **20**B is a cross-sectional side view of a tissue specimen, body wall and a containment bag with two rings according to the present invention.

FIG. **21** is a top perspective view of an expanded containment bag according to the present invention.

FIG. **22** is a top perspective view of a partially collapsed containment bag according to the present invention.

FIG. **23** is a top perspective view of a twisted containment bag according to the present invention.

FIG. **24** is a top view of a twisted containment bag according to the present invention.

FIG. **25**A is a top perspective view of an unassembled two-piece guard according to the present invention.

FIG. **25**B is a top perspective view of an assembled two-piece guard according to the present invention.

FIG. **26** is a top perspective view of a guard according to the present invention.

FIG. **27** is a top perspective view of a retractor ring and guard according to the present invention.

FIG. **28** is a top perspective view of a guard according to the present invention.

FIG. **29** is a partial cross-sectional view of a retractor ring and guard according to the present invention.

FIG. **30** is a top perspective view of a balloon trocar with a removable seal housing according to the present invention.

FIG. **31** is cross-sectional side view of a balloon trocar according to the present invention.

FIG. **32** is a side view of a stabilizer according to the present invention.

FIG. **33** is a bottom view of a stabilizer according to the present invention.

FIG. **34** is a cross-sectional view taken along line **34-34** of FIG. **33** of a stabilizer according to the present invention.

FIG. **35** is a side view of a morcellator stabilizer according to the present invention.

FIG. **36** is a cross-sectional top view of a morcellator stabilizer in a locked configuration according to the present invention.

FIG. **37**A is a top view of a stabilizer in an unlocked configuration according to the present invention.

FIG. **37**B is a cross-sectional top view of morcellator stabilizer in an unlocked configuration according to the present invention.

FIG. **38** is a top perspective view of a containment bag located in a body opening according to the present invention.

FIG. **39** is a top perspective view of a containment bag located in a body opening and a morcellator stabilizer in an unlocked connected to the containment bag according to the present invention.

FIG. **40** is a top perspective view of a morcellator with a protective obturator connected to a stability cap according to the present invention.

FIG. **41** is a bottom perspective view of a morcellator with a protective obturator connected to a stability cap according to the present invention.

FIG. **42** is a top perspective view of a morcellator connected to a stability cap according to the present invention.

FIG. **43** is a top perspective view of a stability cap according to the present invention.

FIG. **44** is a top perspective view of a containment bag according to the present invention.

FIG. **45** is a cross-sectional side view of a tissue specimen inside a containment bag placed across a body wall according to the present invention.

FIG. **46** is a side view of a containment bag deployment instrument according to the present invention.

FIG. **47** is a side view of a containment bag and deployment cap according to the present invention.

FIG. **48** is a top perspective view of a containment bag according to the present invention.

FIG. **49** is a cross-sectional side view of a tissue specimen inside a containment bag placed across a body wall according to the present invention.

FIG. **50** is a top perspective view of a containment bag according to the present invention.

FIG. **50**A is a top perspective view of a containment bag according to the present invention.

FIG. **50**B is a top view of a containment bag according to the present invention.

FIG. **50**C is a top perspective view of a containment bag according to the present invention.

FIG. **50**D is a top perspective view of a containment bag according to the present invention.

FIG. **50**E is a top view of a pattern for a containment bag wherein solid lines depict a valley folds and dashed lines depict mountain folds according to the present invention.

FIG. **50**F is a partial top view of a pattern with dimensions for a containment bag according to the present invention.

FIG. **50**G is a top view of a pattern for a containment bag that is substantially square when viewed from the top according to the present invention.

FIG. **50**H is a top view of a containment bag having a triangular open end according to the present invention.

FIG. **51** is a top perspective view of a guard according to the present invention.

FIG. **52** is a top perspective view of a guard inside a mold according to the present invention.

FIG. **53** is a top perspective view of a guard on a mold according to the present invention.

FIG. **54** is a top perspective view of a containment bag according to the present invention.

FIG. **55**A is a side view of a ring of a containment bag according to the present invention.

FIG. **55**B is a cross-sectional view taken along line **55**B-**55**B of FIG. **55**A of a ring of a containment bag according to the present invention.

FIG. **56**A is a top perspective view of a semi-rigid rod prior to being formed into a ring for a containment bag according to the present invention.

FIG. **56**B is a top perspective view of a ring of a containment bag according to the present invention.

FIG. **57**A is a top view of a containment bag sidewall according to the present invention.

FIG. **57**B is a side view of a containment bag sidewall according to the present invention.

FIG. **58**A is a side view of a containment bag according to the present invention.

FIG. **58**B is a sectional view taken along section **58**B of FIG. **58**A of a containment bag according to the present invention.

FIG. **59**A is a side view of a containment bag according to the present invention.

FIG. **59**B is a top perspective view of a containment bag according to the present invention.

FIG. **60** is a top perspective view of a bag introducer according to the present invention.

FIG. **61** is a top perspective view of a bag introducer according to the present invention.

FIG. **62** is a top perspective view of a containment bag and bag introducer is a top perspective view of a bag introducer according to the present invention.

FIG. **63** is a top perspective view of a containment bag and bag introducer is a top perspective view of a bag introducer according to the present invention.

FIG. **64** is a top perspective view of a guard is a top perspective view of a bag introducer according to the present invention.

FIG. **65** is a cross-sectional side view of a tissue specimen inside a containment bag and a guard placed across a body wall according to the present invention.

FIG. **66** is a top perspective view of a guard according to the present invention.

FIG. **67** is a side view of a two sidewall components of a guard according to the present invention.

FIG. **68** is a top perspective view of a guard according to the present invention.

FIG. **69** is a side view of a guard according to the present invention.

FIG. **70** is a side view of a guard in a body opening according to the present invention.

FIG. **71**A is a top perspective view of a guard according to the present invention.

FIG. **71**B is a top perspective view of a guard according to the present invention.

FIG. **72** is a top perspective view of a guard according to the present invention.

FIG. **73** is a semi-transparent side view of a guard according to the present invention.

FIG. **74** is a semi-transparent side view of a guard according to the present invention.

FIG. **75** is a cross-sectional view of a sidewall of a guard according to the present invention.

FIG. **76** is a top perspective view of a guard according to the present invention.

FIG. **77** is a side view of a guard according to the present invention.

FIG. **78**A is a semi-transparent bottom view of a guard according to the present invention.

FIG. **78**B is a semi-transparent top view of a guard according to the present invention.

FIG. **78**C is a cross-sectional view taken along line **78**C-**78**C of FIG. **78**B of a guard according to the present invention.

FIG. **79** is a semi-transparent top perspective view of a guard according to the present invention.

FIG. **80** is a top view of a guard according to the present invention.

FIG. **81** is a top view of a guard according to the present invention.

FIG. **82** is a top perspective view of a guard according to the present invention.

FIG. **83** is a top perspective view of a guard according to the present invention.

FIG. **84** is a sectional top view of a guard according to the present invention.

FIG. **85** is a perspective top view of a guard according to the present invention.

FIG. **86** is a perspective top view of a guard according to the present invention.

FIG. **87** is a side view of a morcellator and guard according to the present invention.

FIG. **88** is a cross-sectional side view of a morcellator and guard according to the present invention.

FIG. **89** is a bottom perspective view of a morcellator according to the present invention.

FIG. **90** is a top perspective view of an energy morcellator and graspers according to the present invention.

FIG. **91** is a top perspective view of a guard according to the present invention.

FIG. **92** is a semi-transparent, top perspective view of a guard according to the present invention.

FIG. **93** is a side view of a guard according to the present invention.

FIG. **94** is a semi-transparent, side view of a guard according to the present invention.

FIG. **95** is a top view of a guard according to the present invention.

FIG. **96** is a semi-transparent, top view of a guard according to the present invention.

FIG. **97** is a sectional top view of a guard according to the present invention.

FIG. **98** is a semi-transparent, sectional top view of a guard according to the present invention.

FIG. **99** is a semi-transparent, side view of a retractor and guard according to the present invention.

FIG. **100** is a cross-sectional side view of a retractor and guard according to the present invention.

FIG. **101** is a cross-sectional, top perspective view of a retractor and guard according to the present invention.

FIG. **102** is a sectional, top perspective view of a retractor and guard according to the present invention.

FIG. **103** is a semi-transparent, top perspective view of a retractor and guard according to the present invention.

FIG. **104** is a side view of a guard according to the present invention.

FIG. **105** is a top view of a guard according to the present invention.

FIG. **106** is a top perspective view of a retractor and a guard according to the present invention.

FIG. **107** is a top view of a retractor and guard according to the present invention.

FIG. **108** is a bottom perspective view of a guard according to the present invention.

FIG. **109**A is a top perspective view of a guard according to the present invention.

FIG. **109**B is a top perspective view of guard according to the present invention.

FIG. **109**C is a bottom perspective view of a guard according to the present invention.

FIG. **109**D is a top view of a guard according to the present invention.

FIG. **109**E is a top perspective view of a guard according to the present invention.

FIG. **109**F is a bottom perspective view of a guard according to the present invention.

FIG. **109**G is a top view of a guard according to the present invention.

FIG. **110** is a top perspective view of a guard according to the present invention.

FIG. **111** is a top perspective of a two-piece guard according to the present invention.

FIG. **112** is a top perspective view of a blade guard according to the present invention.

FIG. **113** is a cross-sectional, top perspective view of a blade guard according to the present invention.

FIG. **114** is a cross-sectional view of a blade receiver of a blade guard according to the present invention.

FIG. **115** is a bottom perspective view of a blade according to the present invention.

FIG. **116** is a top perspective view of a blade according to the present invention.

FIG. **117** is an exploded, top perspective view of a blade guard assembly according to the present invention.

FIG. **118** is a top perspective is a top perspective view of a blade guard assembly according to the present invention.

FIG. **119** is a cross-sectional, top perspective view of a blade guard assembly according to the present invention.

FIG. **120** is an exploded, top perspective view of a blade guard assembly according to the present invention.

FIG. **121** is an exploded, top perspective view of a blade guard assembly according to the present invention.

FIG. **122** is a cross-sectional, top perspective view of a blade guard assembly according to the present invention.

FIG. **123** is a cross-sectional, top perspective view of a blade guard assembly according to the present invention.

FIG. **124** is a bottom view of a blade guard assembly according to the present invention.

FIG. **125** is a sectional, top perspective view of a blade guard assembly according to the present invention.

FIG. **126** is a bottom perspective view of a blade guard assembly according to the present invention.

FIG. **127** is a side view of a containment bag according to the present invention.

FIG. **128** is a top perspective view of a tissue grasper and morcellator according to the present invention.

FIG. **129** is a sectional side view of a handle of a tissue grasper according to the present invention.

FIG. **130** is a sectional side view of the distal end of the tissue grasper according to the present invention.

FIG. **131** is a sectional, top perspective view of the distal end of the tissue grasper according to the present invention.

FIG. **132** is a sectional, side view of the distal end of the tissue grasper according to the present invention.

FIG. **133** is a top perspective view of a morcellator according to the present invention.

FIG. **134** is a bottom perspective of a morcellator according to the present invention.

FIG. **135**A is a side view of a containment bag according to the present invention.

FIG. **135**B is a top view of a containment bag in a rolled-up configuration according to the present invention.

FIG. **135**C is an end view of a containment bag in a rolled-up configuration according to the present invention.

FIG. **135**D is an end view of a containment bag according to the present invention.

FIG. **136**A is a side sectional view of a body wall and a tissue specimen inside a containment bag according to the present invention.

FIG. **136**B is a side sectional view of a body wall and a tissue specimen inside a containment bag and a tissue guard according to the present invention.

FIG. **137**A is a side view of a containment bag according to the present invention.

FIG. **137**B is a top view of an open containment bag according to the present invention.

FIG. **137**C is a cross-sectional view of a ring of a containment bag according to the present invention.

FIG. **138**A is a side sectional view of a body wall and a tissue specimen inside a containment bag according to the present invention.

FIG. **138**B is a side sectional view of a body wall and a tissue specimen inside a containment bag and a tissue guard according to the present invention.

FIG. **138**C is a side sectional view of a body wall and a tissue specimen inside a containment bag rolled-up around the bag ring and a tissue guard according to the present invention.

FIG. **139**A is a side view of a containment bag according to the present invention.

FIG. **139**B is a top view of an open containment bag according to the present invention.

FIG. **139**C is a side sectional view of a body wall and a tissue specimen inside a containment bag according to the present invention.

FIG. **140**A is a side view of a containment bag according to the present invention.

FIG. **140**B is a top view of a containment bag according to the present invention.

FIG. **141**A is a side sectional view of a body wall and a tissue specimen inside a containment bag according to the present invention.

FIG. **141**B is a side sectional view of a body wall and a tissue specimen inside a containment bag according to the present invention.

FIG. **141**C is a side sectional view of a body wall and a tissue specimen inside a containment bag according to the present invention.

FIG. **141**D is a side sectional view of a body wall and a tissue specimen inside a containment bag and a tissue guard according to the present invention.

FIG. **142**A is a side view of a containment bag according to the present invention.

FIG. **142**B is a cross-sectional view taken along line **142**B-**142**B of FIG. **142**A of a containment bag according to the present invention.

FIG. **142**C is a cross-sectional view of an inflated containment bag according to the present invention.

FIG. **143**A is a side sectional view of a body wall and a tissue specimen inside a containment bag according to the present invention.

FIG. **143**B is a side sectional view of a body wall and a tissue specimen inside a containment bag according to the present invention.

FIG. **143**C is a side sectional view of a body wall and a tissue specimen inside a containment bag according to the present invention.

FIG. **143**D is a side sectional view of a body wall and a tissue specimen inside an inflated containment bag and a tissue guard according to the present invention.

FIG. **144**A is a side view of a containment bag according to the present invention.

FIG. **144**B is a cross-sectional view taken along line **144**A-**144**A of FIG. **144**A of a containment bag according to the present invention.

FIG. **144**C is a cross-sectional view of an inflated containment bag according to the present invention.

FIG. **145**A is a side sectional view of a body wall and a tissue specimen inside a containment bag according to the present invention.

FIG. **145**B is a side sectional view of a body wall and a tissue specimen inside an inflated containment bag according to the present invention.

FIG. **145**C is a side sectional view of a body wall and a tissue specimen inside an inflated containment bag pulled upwardly according to the present invention.

FIG. **145**D is a side sectional view of a body wall and a tissue specimen inside an inflated containment bag and a tissue guard according to the present invention.

FIG. **146**A is a side view of a guard according to the present invention.

FIG. **146**B is a top view of a bottom view of a guard according to the present invention.

FIG. **147**A is a top view of a guard according to the present invention.

FIG. **147**B is a side view of a guard according to the present invention.

FIG. **148**A is a side view of a guard according to the present invention.

FIG. **148**B is a top view of a guard according to the present invention.

FIG. **149** is a top perspective view of a morcellation and bag system according to the present invention.

FIG. **150**A is a top perspective view of a power morcellator according to the present invention.

FIG. **150**B is a top perspective cross-sectional view of a power morcellator according to the present invention.

FIG. **150**C is a sectional view of a power morcellator according to the present invention.

FIG. **150**D is a sectional view of a power morcellator according to the present invention.

FIG. **151** is a top perspective view of a specimen receptacle according to the present invention.

FIG. **152** is a top perspective, sectional view of a bag tube and bag according to the present invention.

FIG. **153**A is a top perspective, sectional view of a containment bag in an open configuration according to the present invention.

FIG. **153**B is a top perspective, sectional view of a containment bag in a closed configuration according to the present invention.

FIG. **154**A is a top perspective, sectional view of a containment bag in an open configuration according to the present invention.

FIG. **154**B is a top perspective, sectional view of a containment bag in a closed configuration according to the present invention.

FIG. **155**A is a top perspective, sectional view of a containment bag in an open configuration according to the present invention.

FIG. **155**B is a top perspective, sectional view of a grasper and containment bag in an open configuration according to the present invention.

FIG. **155**C is a top perspective, sectional view of a containment bag rolled about a grasper according to the present invention.

FIG. **156**A is a top perspective, sectional view of a containment bag in an open configuration according to the present invention.

FIG. **156**B is a top perspective, sectional view of a containment bag in a closed configuration according to the present invention.

FIG. **157**A is a top perspective, sectional view of a containment bag in an open configuration according to the present invention.

FIG. **158**A is a top view of a guard according to the present invention.

FIG. **158**B is a side view of a guard attached to a morcellator shaft according to the present invention.

FIG. **158**C is a top view of a guard attached to a morcellator shaft according to the present invention.

FIG. **158**D is a side, sectional view of a guard and containment bag attached to a morcellator shaft according to the present invention.

FIG. **158**E is a top, sectional view of a guard attached to a morcellator shaft according to the present invention.

FIG. **158**F is a side, sectional view of a guard attached to a morcellator shaft according to the present invention.

FIG. **159** is a top perspective, sectional view of a bag tube and containment bag with a top opening according to the present invention.

FIG. **160** is a side, sectional view of a bag tube and containment bag with a side opening according to the present invention.

FIG. **161** is a side, sectional view of a bag tube and containment bag with a side opening according to the present invention.

FIG. **162**A is a side view of a tissue specimen inside a containment bag according to the present invention.

FIG. **162**B is a side, sectional view of a tissue specimen inside a containment bag attached to a morcellator according to the present invention.

FIG. **162**C is top view of a containment bag attached to a morcellator according to the present invention.

FIG. **163**A is side, sectional view of a containment bag and morcellator system according to the present invention.

FIG. **163**B is a side, sectional view of a body wall, a tissue specimen and a containment bag and morcellator system according to the present invention.

FIG. **163**C is a side, sectional view of a body wall, tissue specimen inside a containment bag and morcellator system according to the present invention.

FIG. **164** is a top perspective view of a shield according to the present invention.

FIG. **165** is a top perspective view of a shield according to the present invention.

FIG. **166** is a top view of a shield according to the present invention.

FIG. **167** is a top partial cross-sectional view of a shield in a locked configuration according to the present invention.

FIG. **168** is a bottom perspective view of a shield according to the present invention.

FIG. **169** is a top perspective view of a shield according to the present invention.

FIG. **170** is a top view of a shield according to the present invention.

FIG. **171** is a top perspective view of a shield according to the present invention.

FIG. **172** is a top perspective view of a shield according to the present invention.

FIG. **173** is a top partial view of a shield according to the present invention.

FIG. **174** is a top partial cross-sectional view of a shield according to the present invention.

FIG. **175** is a top perspective view of a shield according to the present invention.

FIG. **176** is a top perspective view of a shield according to the present invention.

FIG. **177** is a top perspective view of a shield according to the present invention.

FIG. **178** is a top perspective view of a shield according to the present invention.

FIG. **179** is a top perspective view of a shield according to the present invention.

FIG. **180** is a partial top perspective view of a shield according to the present invention.

FIG. **181** is a top perspective view of a shield according to the present invention.

FIG. **182** is a front perspective view of a shield according to the present invention.

FIG. **183** is a rear perspective view of a shield according to the present invention.

FIG. **184** is a top view of a shield according to the present invention.

FIG. **185** is a front view of a shield according to the present invention.

FIG. **186** is a rear view of a shield according to the present invention.

FIG. **187**A is a side cross-sectional view of a shield according to the present invention.

FIG. **187**B is a side cross-sectional view of a shield with a batten at a bottom or posterior end of the shield according to the present invention.

FIG. **187**C is a top perspective view of a shield without a batten according to the present invention.

FIG. **188** is a side cross-sectional view of a shield according to the present invention.

FIG. **189**A is a side cross-sectional view of a shield illustrating an insertion orientation according to the present invention.

FIG. **189**B is a side cross-sectional view of a shield illustrating an inserted orientation according to the present invention.

FIG. **190**A is a side cross-sectional view of a shield illustrating an undeflected, expanded configuration according to the present invention.

FIG. **190**B is a side cross-sectional view of a shield illustrating a deflected, reduced configuration according to the present invention.

FIG. **190**C is a side view of a user's fingers inserted into a shield according to the present invention.

FIG. **190**D is a side cross-sectional view of an introducer inside a shield according to the present invention.

DETAILED DESCRIPTION OF THE INVENTION

The following description is provided to enable any person skilled in the art to make and use the surgical tools and perform the methods described herein and sets forth the best modes contemplated by the inventors of carrying out their inventions. Various modifications, however, will remain apparent to those skilled in the art. It is contemplated that these modifications are within the scope of the present disclosure. Different embodiments or aspects of such embodiments may be shown in various figures and described throughout the specification. However, it should be noted that although shown or described separately each embodiment and aspects thereof may be combined with one or more of the other embodiments and aspects thereof unless expressly stated otherwise. It is merely for easing readability of the specification that each combination is not expressly set forth.

Turning now to FIG. **1**, there is shown a closed morcellation procedure according to the present invention. A small incision is made in a patient in the location of an abdominal wall **10** and a body cavity **12** is accessed through an opening **14** across the abdominal wall **10**. Laparoscopic techniques and instruments such as trocars, laparoscopes, graspers and scalpels may be employed to create the single site opening, spy the targeted tissue and detach the targeted tissue from surrounding tissue structures. Additional incisions or access sites may be employed to insert instruments and scopes to facilitate the procedure. After the targeted tissue **16** such as at least a part of the uterus in a hysterectomy procedure is completely detached, a specimen retrieval bag **18** is inserted through the opening **14** in the abdominal wall **10** and placed inside the body cavity **12**. The bag **18** may be delivered through a trocar or cannula that is placed across the abdominal wall **10**. The bag **18** is unfurled and oriented inside the body cavity **12**. The targeted tissue **16** is placed into the bag

18 through an opening 20 in the bag 18. Various types of bags 18 may be employed. The bag 18 may be transparent such that the contents may be observable from outside the bag 18 via a scope placed into the body cavity 12 through a secondary incision site across the abdominal wall 10. The contents of the bag 18 may be illuminated from outside the bag 18. The location of the targeted tissue 16 may also be observed through a transparent bag 18 to ascertain the progress of morcellation as well as the position and proximity of the targeted tissue 16 relative to the opening 14. Also, the bag 18 is observed via a secondary site insertion to ascertain the state of the bag 18 making sure that it is not tangled and twisted and that the specimen is moved toward the opening without pulling the bag 18 along with it which may result in the bag being accidentally coming into contact with a blade and being severed. An opaque bag 18 may also be employed. The material of the bag 18 is also important. Generally, made of plastic, the bag is strong enough to withstand pulls and tugs, has sufficient stretch properties and is relatively thin, flexible and resilient to puncture and tears. The bag is folded and reduced in size such that it can be inserted through the small incision/trocar of approximately at least 5 mm in diameter. Also, when opened, the bag is large enough to receive a large piece of tissue, extend through the opening 14 to the surface of the abdominal wall 10 and create a sufficiently large working space inside the bag 18 for instruments, scopes, morcellators 24, and scalpels 26 as shown in FIG. 1. The bag 18 includes a tether or drawing string 22 configured to cinch the opening closed and to open the bag 18. The bag 18 withstands insufflation pressures and does not leak. Various examples of bags and devices for inserting, deploying and/or retrieving bags to be included or integrated into the morcellation system in which the entire systems, portions of the systems or combinations of the systems and/or components thereof arranged to provide a containment of object to be morcellated in accordance with various embodiments of the present invention are described in U.S. patent application Nos. 08/540,795, filed Oct. 11, 1995; 11/549,701, filed Oct. 16, 2006; 11/549,971, filed Oct. 16, 2006; 12/902,055, filed Oct. 11, 2010; and 13/252,110, filed Oct. 3, 2011; the entire disclosures of which are hereby incorporated by reference as if set forth in full herein. Additional bag variations will be described in greater detail hereinbelow.

After the targeted tissue 16 is placed inside the bag 18, the tether 22 is grasped by hand or with a laparoscopic grasper and at least a portion of the bag 18 is pulled through the abdominal wall opening 14. Pulling the tether 22 closes the bag opening 20. The initial incision may be increased to approximately 15-40 mm prior to pulling the bag 18 through the opening 14. If the targeted tissue 16 is too large to fit through the opening 14, the targeted tissue 16 will sit inside the body cavity 12 below the abdominal wall 10. The remainder of the bag 18 including the opening 20 of the bag 18 will be pulled through the abdominal wall opening 14 and extend through the opening 14 to outside the patient and along the upper surface of the abdominal wall 10 as shown in FIG. 1. The bag 18 may be rolled down and/or pulled taut across the surface of the abdominal wall 10 to maintain its position and provide some tissue retraction at the opening 14.

A guard 28 is inserted in through the opening 20 of the bag 18. The guard 28 has a diameter in the incision/opening 14 such that when it is placed inside the opening 14 the guard 28 is retained in position. The guard 28 may also retract tissue at the incision/opening and, as such, be called a retractor. One variation of a guard 28 is shown in FIGS. 2-6 and another variation is shown in FIGS. 7-10. The guard 28 includes an inner surface 30 and an outer surface 32 defining a sidewall interconnected between a top 34 and a bottom 36. The inner surface 30 defines a central lumen 38 that extend between the top 34 and the bottom 36. The inner surface 30 includes a curved, funnel portion near the top 34 that may be convex or frusto-conical. The guard 28 includes a top circumferential flange 40 and a bottom circumferential flange 42 that extend radially outwardly to create surfaces for seating against the upper and lower surfaces, respectively, of the abdominal wall 10. The top flange 40 may include features such as apertures for passing the tether 22 and securing the guard 28 to the bag 18. The guard 28 has an overall length of approximately 2.5 inches; however, guards 28 of various lengths may be employing depending on the thickness of the tissue wall 10 to be penetrated. A guard 28 that has a variable length, such as a telescoping guard 28, is within the scope of the present invention. The inner diameter of the guard 28 at mid-length is approximately 1.3 inches and can be as small as approximately 0.6 inches. The outer diameter of the guard 28 at mid-length is approximately 1.6 inches and conforms to the incision/opening such that the top circumferential flange 40 is retained in position due to its larger overall diameter relative to the diameter of the guard 28 at mid-length. The wall thickness at mid-length is approximately 0.16 inches and may be as thick as approximately 0.3 inches. The guard 28 is made of any polymer such as KRATON® or polyethylene; however, the guard may be made of any suitable material including metal. A guard 28 can be flexible such that it can be slightly compressed for ease of insertion through the opening 14 in the abdominal wall 10. The thickness of the guard 28 and/or choice of material for the guard 28 are selected such that the guard 28 is capable of withstanding cutting and puncture forces from blades, knives, scalpels, morcellators and the like. The guard 28 serves as a cutting board or surface against which targeted tissue is placed for cutting prior to removal. The targeted tissue 16 is grasped with a laparoscopic grasper and pulled upwardly toward the opening 14. At least a portion of the targeted tissue 16 that is to be cut is then held in position in the location of the guard 28 anywhere along its length. A blade such as a scalpel or morcellator is then moved into contact with that portion of the targeted tissue to be cut in the location of the guard 28 and that portion of the targeted tissue is cut. The cut portion of targeted tissue is pulled up through the opening 14 to the surface outside the patient and a new section of targeted tissue is brought into position along the guard 28 to be cut and removed. This process is repeated until the entirety of the specimen is removed in whole or in part from the bag 18. The guard 28 serves as protection for the bag 18. The practitioner is free to cut the targeted tissue in the location of the guard 28 and even against the guard's inner surface 30 mitigating the consequences of severing the bag 18 with the scalpel or morcellator. The guard 28 not only protects the specimen retrieval bag 18 from accidental incision, but also, the guard 28 protects surrounding tissue, such as the abdominal wall, from accidental incision. The guard 28 preserves the integrity of the bag 16 and effectively maintains a closed morcellation system. The surgeon is able to quickly and safely reduce the specimen and remove it from the abdominal cavity.

Once the guard 28 is placed, the surgeon will grasp the specimen 16 and pull it up through the incision as far as possible. The surgeon will then begin morcellating the specimen 16 with a scalpel 26, cutting the specimen 16 to reduce its size. Ideally, the surgeon will "core" or "peel" the specimen **16** to keep it in one piece as much as possible. However, more likely than not, the specimen **16** will be reduced in multiple pieces. While morcellating through the incision, the surgeon may maintain pneumoperitoneum in the abdominal cavity **12** so that the progress of the morcellation can be observed laparoscopically through a lateral port placed at a secondary site into the cavity **12**. The lateral port lies outside the bag **18** and the surgeon may look through the transparent bag, or at the bag itself to ensure it maintains its integrity. Once the specimen **16** is morcellated, crushed, reduced enough to pull the remaining portion through the incision, the guard **28** is removed, and the bag **18** and its contents, including the pieces created during morcellation, are pulled out of the patient. The bag **18** will prevent the remaining small pieces from being left in the abdominal cavity **12**, maintaining the closed system; whereas in a traditional morcellation, the surgeon must go back and painstakingly search and collect the pieces scattered amid the pelvic cavity to prevent potentially seeding new tumor sites. The surgeon may choose to take a final look at the patient laparoscopically and then close the wounds.

While described for an abdominal removal and morcellation, the above-described procedure can be performed via the vagina orifice as well if the cervix has been removed. Following the same process, the bag **18** will be introduced and the specimen **16** placed into the bag **18** laparoscopically. Rather than pull the tether **22** through the abdominal wall opening **14**, it would be pulled through the vagina. In the same way, the specimen **16** would sit at the base of the vagina while the bag **18** goes through the vagina and opens up outside the patient. The surgeon may roll the bag **18** down or pull it taut to maintain its position and provide some retraction. The surgeon would place the guard **28** vaginally to protect integrity of bag **18** and to maintain a closed system, grasp the specimen **16** to bring it out, and morcellate to reduce the size of the specimen **16**. Morcellation of the specimen is performed in the location of the guard **28** and/or against the guard **28** surface protecting the surrounding tissue and bag from inadvertent incisions. The surgeon may maintain pneumoperitoneum and watch the progress of the morcellation laparoscopically. Once the specimen **16** is morcellated, crushed, reduced enough to pull the remaining portion through the vagina, the guard **28** is removed, and the bag **18** and its contents, including the pieces created during morcellation, are pulled out of the patient. The bag **18** will prevent the remaining small pieces from being left in the abdominal cavity preventing harmful material such as cancerous cells form being disseminated in the abdominal cavity, maintaining the closed system; whereas in a traditional morcellation, the surgeon must go back and painstakingly search and collect the pieces scattered amid the pelvic cavity search for the pieces amid the pelvic cavity. The surgeon may choose to take a final look at the patient laparoscopically and will close the vaginal cuff and abdominal incisions.

In one variation shown in FIG. **11**, the guard **28** is configured to attach to a cap **44** such as a GELSEAL® cap manufactured by Applied Medical Resources Corporation in California. The cap **44** includes a rigid ring **46** detachably connectable to the proximal end of the guard **28**. The cap **44** includes a lever **48** for locking the cap **44** to the guard **28**. The cap **44** includes a penetrable portion **50** that can be made of gel configured to seal against instruments inserted therethrough and maintain pneumoperitoneum inside the abdominal cavity. FIGS. **12-13** illustrate the cap **44** connected to the guard **28**. An insufflation port **52** may be provided in the cap **44**. The cap **44** snaps onto the guard **28** and may be sealingly locked thereto with the lever lock **48** such that pneumoperitoneum is maintained. FIG. **14** illustrates a cap **44** having multiple ports **54**. Each port **54** is configured to receiving laparoscopic instruments and includes one or more internal seals for sealing against inserted instruments. A multi-port cap **44** advantageously permits the insertion of a grasper, laparoscope and/or morcellator through a single site.

FIGS. **15-17** illustrate another variation of the guard **28** that includes a balloon **56** at the distal end of the guard **28**. The balloon **56** is shown in an inflated configuration in FIG. **15**. In the inflated configuration, the balloon **56** extends radially outwardly to create a wide flange for securing against the abdominal wall **10** inside the abdominal cavity **12** making it difficult for the guard **28** to be inadvertently removed from the opening **14**. FIG. **16** illustrates the balloon in a deflated configuration in which the guard **28** is easily inserted into and removed from the opening **14**. The guard **28** of FIGS. **15-17** may also connect to a cap **44**. The guard **28** can be made of any polymer material including polycarbonate or similar material.

A funnel-shaped entry at the proximal end of the guard **28** has been described above. The funnel-shaped entry may be enlarged radially outwardly in another variation to create a larger surface area against which tissue may be cut. The flared proximal end also assists in retaining the bag in position outside the patient and between the guard **28** and the tissue margin **10**. In another variation, the guard **28** includes a flared distal end that is frusto-conical or curved in shape. The flared distal end may include an enlarged radially extending flange that spreads the bag **18** laterally inside the abdominal cavity. The flared distal end assists in keeping the bag in an open position and away from coming into contact with the specimen and away from the distal entry into the guard **28**, thereby, further protecting the bag **18** from inadvertent contact with a blade. In the flared distal end variation of the guard **28**, the distal diameter of the guard **28** at the distal opening is greater than the diameter of the guard **28** at mid-length. In the flared proximal end variation of the guard **28**, the proximal diameter of the guard **28** at the proximal opening is greater than the diameter of the guard **28** at mid-length. In yet another variation, the guard **28** includes a flared proximal end and flared distal end retaining the advantages of both described above.

Methods for removal of tissue that employ the guard **28** with a cap **44** will now be described. After completing the laparoscopic hysterectomy or any other dissection, the specimen **16** described previously is completely detached from surrounding tissue and awaiting removal. The surgeon will insert the specimen bag **18** which may be transparent into the pelvis and place the specimen **16** in the bag **18**. The surgeon will then grab the tether **22** on the bag **20** with a laparoscopic grasper and pull the bag **18** up and through the abdominal wall incision **14** where a trocar was previously positioned. If necessary, the surgeon will extend the incision to 15-25 mm prior to pulling the bag all the way through. Because the specimen **16** is too large to fit through the opening **14**, the specimen **16** will sit right below the abdominal wall **10**, inside the pelvic cavity, while the remainder of the bag **18** is pulled up out of the incision and is opened outside the patient as shown in FIG. **1**. The surgeon may roll the bag down or pull it taut to maintain its position and provide some retraction. The surgeon will then insert the guard **28** into the incision to protect the bag **18** and abdominal wall **10** during morcellation, as well as to retract the incision. The integrity of the bag is preserved and the closed system is maintained.

The guard **28** is placed into the opening **20** of the bag **18** and positioned within the incision such that the guard **28** extends across the tissue margin **10**. A cap **44** is connected to the guard **28**. The cap **44** snaps onto the proximal top flange **40** and the lever **48** of the cap **44** is moved into a locked position sealing the cap **44** onto the guard **28**. The guard **28** may include a reinforced wire **58** to maintain the shape and rigidity of the top flange **40**. The wire **58** is visible in FIGS. **1**, **5-6**, **10** and **12**. With the cap **44** in position, the bag **18** may be insufflated. In one variation, the bag **18** alone is insufflated relative to the abdominal cavity **12**. In another variation, both the bag **18** and the abdominal cavity **12** are insufflated. In another variation, both the bag **18** and the abdominal cavity **12** are insufflated such that the pressure inside the bag **18** is greater than the insufflation pressure of the cavity **12**. Insufflation may be provided through a trocar inserted through the cap **44** or via the insufflation port **52** in the cap **44**. With the cap **44** in position, a power morcellator **24** is inserted through the penetrable portion **50** of the cap **44** and into the interior of the bag **18**. Alternatively, if a multi-port cap **44** is employed, a morcellator **24** may be inserted through one of the ports **54**. A surgical grasper is also inserted through the cap **44** either through the penetrable portion **50** or through one of the ports **54** and the targeted tissue is grasped and pulled proximally toward the opening and into the central lumen **38** of the guard **28** where the targeted tissue is morcellated in the zone of protection afforded by the guard **28**. As mentioned previously, the guard **28** protects the bag **18** from being punctured and, thereby, assists in maintaining a closed morcellation system. The power morcellator **24** is placed through the gel cap **44** to a depth so as to maintain the bladed distal end **60** of the power morcellator **24** in the central lumen **38** and in the protected region or length of the guard **28**. Targeted tissue is pulled by a grasper toward the blade **60** for morcellation and removal. Removed tissue will travel through the central lumen of the power morcellator **24**.

Rather than place the morcellator **24** through the penetrable portion **50** of the cap **44**, a stabilizer is provided which will work with the bag **18** or guard **28** and serve to hold the morcellator **24** in place at a depth within the protected zone inside central lumen **38** of the guard **28**. Maintaining the morcellator within the lumen **38** of the guard **28** prevents the morcellator **24** from coming into contact with the bag **18** wall during the procedure thereby protecting the bag from inadvertent tearing. A variation of the stabilizer will be described further below.

After placing the morcellator **24** and cap **44**, the surgeon may choose to insufflate the bag **18** as well as the abdominal cavity **12**. The surgeon may observe the position of the morcellator **24** and targeted tissue **16** as well as the integrity of the bag **18** making sure it is not twisted or approaching too closely to the distal end **60** of the morcellator **24**. The observation is made via a laparoscope placed through a port **54** at the same incision site or through a secondary incision site providing a lateral port. The specimen **16** is grasped with a tenaculum and pulled through the power morcellator **24** to reduce its size. Ideally, the surgeon will "core" or "peel" the specimen to keep it in one piece as much as possible. However, more likely than not, the specimen **16** will be reduced to multiple pieces. Once the specimen **16** is morcellated enough to pull the remaining tissue through the incision, the morcellator **24**, gel cap **44** or stabilizer, and guard **28** retractor are removed, and the bag **18** and its contents, including the pieces created during morcellation, are pulled out of the patient. The bag **18** will prevent the remaining small pieces from being left behind in the abdominal cavity **12**, maintaining the closed system; whereas in a traditional morcellation, the surgeon must go back and painstakingly search and collect the pieces scattered amid the pelvic cavity. The surgeon may choose to take a final look at the patient laparoscopically and will close the wounds.

While described for an abdominal removal and morcellation, the above described power morcellation procedure can be performed via a bodily orifice such as a vagina as well. Following the same process, the bag **18** will be introduced and the specimen **16** placed into the bag **18** laparoscopically. Rather than pull the tether **22** through the abdominal wall opening **14**, the tether **22** would be pulled through the vagina. In the same way, the specimen **16** would sit at the base of the vagina while the bag **18** goes through the vagina and opens up outside the patient. The surgeon may roll the bag down or pull it taut to maintain its position and provide some retraction. The surgeon would place the guard **28** vaginally into the bag **18** to protect integrity of bag and to maintain a closed morcellation system, place the cap **44** on the guard **28** and place the power morcellator **24** through a gel cap **44** or stabilizing cap. The surgeon would then grasp the specimen **16** with a tenaculum and bring it out through the power morcellator **24** vaginally to reduce the size of the specimen **16**. The surgeon would maintain pneumoperitoneum and observe the progress of the morcellation laparoscopically. Once the specimen **16** is morcellated enough to pull the remaining portion through the vagina, the morcellator **24**, gel cap **44** or stabilizing cap, guard **28** and/or retractor are removed, and the bag **18** and its contents, including the pieces created during morcellation, are pulled out of the patient. The bag **18** will prevent the remaining small pieces from being left in the abdominal cavity **12**, maintaining the closed morcellation system; whereas in a traditional morcellation, the surgeon must go back and painstakingly search and collect the pieces amid the pelvic cavity and vagina. The surgeon may choose to take a final look at the patient laparoscopically and will close the vaginal cuff and abdominal incisions.

Turning now to FIGS. **18-19**, there is shown a retractor **62** comprising a first ring **64** and a second ring **66** interconnected by a flexible sidewall **68**. The retractor **62** is described in greater detail in one or more of the references incorporated in this application by reference. The second ring **66** can be compressed and inserted through the small incision where it expands to create a securement against the abdominal wall **10** inside the cavity **12**. The first ring **64** resides above the abdominal wall **10** outside the patient where it can be rolled down to retract and enlarge the opening **14** in the abdominal wall. The retractor **62** can be employed with any of the variations described above. In use, the retractor **62** is inserted prior to insertion of the bag **18** into the cavity or orifice. In one variation, the first ring **64** has a larger diameter than the second ring **66** as shown in FIG. **19**. The larger first ring **64** relative to the second ring **66** allows for more space to work and cut tissue against. The sidewall **68** is made of a polyurethane laminate or similar material including woven material to resist cutting through the sidewall **68**.

FIGS. **20A-20B** illustrate a modified retractor **62** configured into a bag **70**. The bag **70** includes the first ring **64** and second ring **66** interconnected by a flexible substantially cylindrical sidewall **68**. The opening at the second ring **66** is closed off by a depending bag portion forming a base **72** for the bag **70**. The bag **70** is inserted in the same manner as described above with respect to the bag **18** and used in the same manner. The second ring **66** is compressed and passed through the small incision into the abdominal cavity **12**. The sidewall **68** is rolled around the top ring **64** to retract and enlarge the opening **14** and a guard **28** connectable to the first ring **64** may or may not be employed at the opening inside the bag **70**. The specimen **16** is removed in the same manner as described above via manual or power morcellation. The first ring **64** is also connectable to the gel cap **44**.

Turning now to FIGS. **21-24**, there is shown a bag **70** having only a first ring **64** forming an opening, a flexible cylindrical sidewall **68** and a base **72**. The first ring **64** is resilient and compressible into a collapsed elongate configuration suitable for passing into a small incision or through the lumen of a trocar. The arrow in FIG. **22** illustrates the vertical direction of collapse of the bag **70**. The collapsed bag **70** is then subsequently easily compressed in a lateral direction and deployed into the abdominal cavity. The first ring **64** is compressed into an elongated shape. The compressed bag is allowed to form is original shape with the first ring **64** expanding. In the expanded configuration, the bag **70** is easily oriented within the cavity **12**. The collapsed bag **70** conveniently lies flat inside the abdominal cavity and includes two sides. The bag **70** in a collapsed configuration does not have a right side up because either side can be used to place the specimen within the boundaries of the first ring **64**. The first ring **64** serves as a perimeter guide for specimen placement and may be brightly colored so that it can be easily observed with a laparoscope. After the specimen is placed within the perimeter of the first ring **64**, the first ring **64** is grasped and lifted to locate the specimen inside the bag **70**. The same may be said of the two-ring bag **70** described above. As shown in FIGS. **23-24**, the bag **70** may be twisted to create a spiral form to collapse or to shorten the length of the bag. This feature is advantageous not only for insertion of the bag through a small incision but also to raise the specimen closer to the opening of the bag as it is being morcellated.

Turning now to FIG. **25**, there is shown a guard **74** that is configured for use with a retractor **62** depicted in FIGS. **18-19** or with a bag **70** of FIGS. **20-24**. The guard **74** includes a rigid ring **76** with a plurality of inwardly extending flaps **78** meeting in the center or, as shown in FIG. **25**, forming an opening **80** in the center. The flaps **78** are attached to the ring **76** such that they flex relative to the ring **76** permitting targeted tissue **16** to be removed out past the flaps **76**. The flaps **78** also flex distally permitting instruments to be inserted past the guard. The flaps **78** are made of the same material as the guard **28** such as polycarbonate, LDPE, HDPE or similar material and as such, the flaps **78** are sufficiently resilient, cut-resistant and resist penetration with a blade and, thereby, protect the retractor **62** or bag **70**. The guard **74** may comprise a single ring **76** with flaps **78** or be comprised of two similar rings **76***a*, **76***b* having flaps **78***a*, **78***b*, respectively. The two rings **76***a*, **76***b* are connected together such that the flaps **78***a* are offset from the flaps **78***b* so as to create a layered flap construct that provides protection between the flaps **78***a*, **78***b*. The targeted tissue **16** is pulled up through the openings **80***a*, **80***b* wherein when in the region of the guard **76**, the targeting tissue **16** is cut. The targeted tissue **16** may also be cut when positioned against the flaps **78***a*, **78***b*.

Turning now to FIG. **26**, the guard **74** includes an upstanding flat perimeter wall **82** configured to snap under the first ring **64** of the retractor **62** or bag **70** as shown in FIG. **29**. The guard **74** may also include flanges **84** configured to snap with the first ring **64** of the retractor **62** or bag **70** as shown in FIG. **28**. FIG. **27** illustrates a rigid guard **74** without flaps. The rigid guard **74** of FIG. **27** provides a large cutting surface against which targeted tissue may be located and cut without flexing as much as a guard **74** with flexible flaps **78**. The guard **74** may also include a depending portion **86** in the shape of a funnel to provide greater protection in the vertical direction for the bag/retractor **70**, **62** and/or wound. The guard **74** is placed on top of the retractor **62** or bag **70** and within the perimeter of the first ring **64**. The guard **74** is then snapped under the first ring **64** to join the guard **74** to the first ring **64**. The guard **74** also assists in keeping the bag **70** or retractor **62** in position while being made of material that resists penetration when being morcellated. In other variations, the guard is configured to snap over the ring.

Turning now to FIG. **30**, there is shown a trocar **88** having a first balloon **90** and a second balloon **92**. The trocar **88** includes a removable seal housing **94** containing one or more seals for sealing against inserted instruments. The trocar **88** includes a central lumen **96** that extends through the seal housing **94** and trocar **88**. The lumen **86** is sized and configured to receive a power morcellator **24**. The trocar **88** may further include an obturator (not shown) configured to penetrate an abdominal wall. The trocar **88** may be inserted through a gel cap **44** described above or directly through an incision in the abdomen. A bag **18**, **62** may be deployed through the lumen **86**, and a specimen **16** inserted into the bag **18**, **62**. The tether **22** of the bag **18** or first ring of bag **62** is pulled through the incision and the trocar **88** is reinserted. The second balloon **92** is inflated. In the inflated configuration, the second balloon **92** extends laterally pushing the bag **18**, **62** laterally and out of the way of the distal end of the trocar **88** and away from the bladed distal end of a morcellator. A power morcellator **24** is inserted into the lumen **96** of the trocar **88**. The morcellator **24** may be prevented from extending beyond the distal end of the trocar **88** by way of a stop formed on the trocar **88** that would abut the morcellator **24** and prevent it from moving distally. A tenaculum is inserted into the lumen of the morcellator **24** and tissue is grasped and pulled toward the morcellator. Tissue is cut and extracted from the specimen bag. The first balloon **90** is inflated and is resident above the abdominal wall. Both the first balloon **90** and the second **92** help retain the trocar **88** in position relative to the abdominal wall **12**. FIG. **31** illustrates another trocar **88** having a seal housing **94** and an insufflation port **98** for inflating the at least one balloon **92**.

Turning now to FIGS. **32-39**, a stabilizer **100** will now be described. The stabilizer **100** includes a flange **102** configured to connect with a bag **18**, **70** or guard **28**. The stabilizer **100** includes a central portion **104** that defines a lumen **106** and houses a lock **108**. The lumen **106** is sized and configured to receive a power morcellator **24**. When inserted into the lumen **106**, the height of the morcellator **24** relative to the abdominal wall may be adjusted and then locked in position with the lock **108**. The lock **108** has an unlocked configuration in which the lever **110** is released permitting the morcellator **24** to translate vertically within the lumen **106**. The lock **108** also has a locked configuration in which the lever **110** is depressed locking the translation of the morcellator **24**. The lock **108** operates to increase friction onto the morcellator **24** shaft holding it in place.

Turning now to FIGS. **40-41**, the stabilizer **100** is shown connected to a power morcellator **24**. The system of FIGS. **40-41** includes a ratcheting mechanism that includes a toothed bar on the morcellator **24** configured to engage with a pawl (not shown) inside the central portion **104** of the stabilizer **100**. Buttons **114** are shown on the stabilizer **100** to release and engage the pawl in order to unlock and lock the stabilizer **100** from the morcellator **24** to free or arrest their relative vertical translation. The morcellator **24** includes an integrated scope and illuminator **116**, an insufflation port **118** and a mechanical drive connection **120** to rotate the morcellator blade **122**. The stabilizer **100** includes a lower flange **102** that extends outwardly to engage a bag or retractor or guard as described above. In one variation, the stabilizer **100** is configured such that activation of the morcellator **24** is prevented if the pawl of the stabilizer is within a certain range of the toothed bar **112** providing a safety shut-off mechanism so that the morcellator **24** is not activated when in a position that is too distal, or beyond the range of the guard and, therefore, would threaten inadvertent contact with the bag. Another variation of the stabilizer **100** is shown in FIGS. **42**-**43** wherein like numbers are used to describe like parts. The stabilizer **100** has a different shape and the pawl elements **122** are visible in FIG. **43**.

FIGS. **44**-**45** illustrate a bag **18** having a tether **22** and a flexible ring **64** at the opening **20**. The bag material can be clear or opaque and the ring **64** is compressible for insertion through a small incision. The sidewall **68** can be rolled about the first ring **64** to reduce the bag height and, therefore, raise the specimen closer to the opening and, thereby, make the specimen more accessible for morcellation.

FIGS. **46**-**47** illustrate a bag deployment instrument **124** for the bag **18** of FIG. **47**. The instrument **124** may be inserted through a trocar. The bag **18** includes an opening **20**, tether **22** and deployment cap **21**.

FIGS. **48**-**49** illustrate another bag variation having a first ring **64**, a second ring **66** and a sidewall **68** therebetween and a base **72**. A resilient second ring **66** located at the bottom of the bag **18** causes the bag to flare open when disposed inside the body cavity **12** and helps prevent material from clinging to the specimen **16**. After a specimen is placed into the bag **18**, the first ring **64** is pulled to the surface of the abdominal wall **10** as shown in FIG. **49**.

FIG. **50** illustrates a bag **18** having a first ring **64** made of nitinol to allow for easier insertion through a small incision while providing support to keep the bag **18** open inside the abdominal cavity **12**.

FIGS. **50**A to **50**D illustrate a bag **18** in accordance with various embodiments in a non-collapsed state or expanded or partially expanded state. As shown, the bag **18** includes a closed end **126** and at least one open end **128**. The open end **128** in accordance with various embodiments comprises a tether or drawstring **130** that encircles the open end **128** of the bag **18**. Manipulation of the tether **130** closes the open end **128** of the bag **18**. The bag **18** as illustrated includes a plurality of preformed folds **132** or a predefined deformation pattern in the wall **134** of the bag **18** between the closed end **126** and the open end **128** of the bag **18**. The bag **18** in accordance with various embodiments is formed to provide a tendency of the bag **18** to be in a collapsed and flat state providing a minimal height with the open end **128** facing up or towards the opening in the body cavity and having a maximum width, diameter or opening dimension and the closed end **126** facing away from the opening in the body cavity and arranged to lay flat and stable along the body cavity. In accordance with various embodiments, when force is applied in one direction, the height of the wall **134** of the bag **18** increases to capture or surround a specimen within the bag **18**. The folds **132** or deformation pattern ensures that the increase of the bag **18** occurs linearly in the direction in which the force is being applied. In accordance with various embodiments, a weight, the specimen or an opposite force is applied to the bag **18** to further assist in the increase in the bag **18** or in particular the linearly directed increase in the bag **18**.

In one embodiment, the bag **18** is folded flat or in an accordion fashion prior to deployment into the patient's body. The bag **18** when deployed lays flat with the open end **128** of the bag **18** on the top and the closed end **126** on the bottom. The closed end **126** for example lays on the bottom the patient's body cavity. As such, the open end **128** of the bag **18**, due to the pattern formed on the wall **134** of the bag **18**, remains open and thus does not need to be held open. Additionally, due to the pattern, the open end **128** is biased open and resists closing. The difficulty and time expended to place the specimen on and/or within the bag is thereby reduced.

The surgeon places the specimen on the top of the bag **18** on or over the open end **128** of the bag **18**. By pulling the tether **130**, the wall **134** of the bag **18** is pulled up and around the specimen thereby containing the specimen. The opposite forces of the pull on the tether **130** and the weight of the specimen on the bag **18** cause the deformation pattern along the wall **134** of the bag **18** to unfold or straighten. In one embodiment, the bottom or closed end **126** of the bag **18** includes a weight or an attachable weight to ensure sufficient opposite force is provided to straighten the wall **134** of the bag **18** as the tether **130** is being pulled. In one embodiment, one or more tabs **136** or portions of the bag **18** around the open end **128** of the bag **18** are provided to ensure that forces pulling the bag **18** out or towards the opening in the body cavity also cause the wall **134** or one or more folds **132** of the wall **134** of the bag **18** to unfold.

In one embodiment, when the weight of the specimen pulls the bag **18** down it causes the shorter sides of the bag **18** to pull downward decreasing the overall containment size. In accordance with various embodiments, to compensate or reduce the decrease in overall containment size, one or more tabs **136** are provided at the open end **128** of the bag **18** that lies on the flat side of the bag **18** and prevent the bag **18** from decreasing in its overall containment size. As such, in one embodiment, when the bag **18** is flattened, the distance along the edge of the bag **18** is greater than the distance along the cross-section of the bag **18**. The tether **130** in one embodiment is threaded through the tabs **136**.

For a particular desired height and/or width of the bag **18**, the pattern as shown in FIGS. **50**E-**50**F is used to optimally to create the wall pattern to ensure the proper deployment and operation (e.g., straightening and containment). In one embodiment, the bag **18** is pre-formed with the illustrated pattern and the bag **18** is then heated to maintain the flat and patterned state. A tether **130** is attached or threaded through tabs **136** at the open end **128** of the bag **18**. As such, the heat, pressure or preformed condition to place the bag **18** in an initial flat, stabled and patterned state assists in keeping the deformation pattern and causes or biases the bag **18** to the collapsed and deformed state when placed inside the body cavity. A downward force applied to the center of the bag **18** assists in causing the folds **132** to straighten or unfold and thereby expand or lengthen the height of bag **18** to engulf the specimen. As shown, the valley and/or mountains of the pattern can have the same height and/or width to further ensure a linear and constant or measured size increase. In various embodiments, the valleys or mountains of the pattern can have different dimensions and apply equal force on the inside walls of a cylindrical deployment device which lowers the force needed to deploy the bag **16**.

In accordance with various embodiments, the top or open end and bottom or closed end of the bag are twisted in alternating directions causing spiral patterns on the wall of the bag. The bag and/or spirals are heated or compressed to keep their shape. The spiral folds assist in keeping the bag flat after being inserted into the body. After the specimen placed on the open end of the bag, the pulling of the tether encircling the open end of the bag causes the wall of the bag to unfold or untwist. As such, opposite forces of the pull on the tether or open end of the bag and the weight of the specimen and/or attached or added weight at the closed end or bottom of the bag causes the bag to untwist and engulf the specimen as the bag is pulled towards the opening in the body cavity. In accordance with various embodiments, the open end includes a first ring and/or the closed end includes a second ring. The first and/or second ring may be reinforced or include a wire or rod to bias the open end in an open or enlarged state to receive a specimen, increase the tendency for the bag to remain in a flat or unexpanded condition or to provide weight to assist in expansion of the bag or stability in the placement of the bag or the receiving and capturing of the specimen.

In accordance with various embodiments, the top or open end and bottom or closed end of the bag are collapsed directly towards each other. The wrinkles or folds in the wall of the bag between the open and closed end of the bag are heated or compressed to keep their pattern/shape and assist in keeping the bag flat after being inserted into the body. After the specimen placed on the open end of the bag, the pulling of the tether encircling the open end of the bag causes the wall of the bag to un-wrinkle or straightens. As such, opposite forces of the pull on the tether or open end of the bag and the weight of the specimen and/or attached or added weight at the closed end or bottom of the bag causes the bag to straighten and engulf the specimen as the bag is pulled towards the opening in the body cavity. In accordance with various embodiments, the open end includes a first ring and/or the closed end includes a second ring. The first and/or second ring may be reinforced or include a wire or rod to bias the open end in an open or enlarged state to receive a specimen, increase the tendency for the bag to remain in a flat or unexpanded condition or to provide weight to assist in expansion of the bag or stability in the placement of the bag or the receiving and capturing of the specimen.

As shown in FIGS. **50**G and FIG. **50**H, the bag **18** can have various upper, base and overall shapes including but not limited to cubes, prisms, cylinders, spheres, dodecahedrons, hemispheres, cones, cuboids, polygons and so on and is enclosed with one or more openings and including various deformation wall patterns to cause the bag to tend to remain in a collapsed or substantially flat shape and to expand in linear or controlled fashion when manipulated to contain and engulf the specimen within.

Various examples of access systems to be included or integrated into the morcellation system in which the entire access systems, portions of the access systems or combinations of access systems and/or components thereof arranged to provide a channel and/or a protective region in accordance with various embodiments of the present invention are described in U.S. Patent Application Nos. 13/865,854, filed Apr. 18, 2013; 61/880,641, filed Sept. 20, 2013; 12/578,422, filed Oct. 13, 2009, 61/104,963, Oct. 13, 2008; 12/358,080, filed Jan. 22, 2009; 11/374,188, filed Mar. 13, 2006; 11/683,821, filed Mar. 8, 2007; 12/396,624, filed Mar. 3, 2009; 14/209,161, filed Mar. 13, 2014; 12/873,115, filed Aug. 31, 2010; 12/840,989, filed Jul. 21, 2010; 11/548,758, filed Oct. 12, 2006; 10/516,198, filed Nov. 30, 2004; and 10/666,579, filed Sept. 17, 2003; the entire disclosures of which are hereby incorporated by reference as if set forth in full herein.

Turning now to FIGS. **51-53**, there is shown another variation of the guard or shield **200** according to the present invention. The guard **200** has a general shape of a spiral. The guard **200** includes a first inner end **202** and a second outer end **204**. The first end **202** and the second end **204** are interconnected by a central portion **206** also called a leaf or band. The guard **200** has an inner surface **208** and an outer surface **210** interconnected by a top end **212** also called a trailing end or proximal end and a bottom end **214** also called a leading end or distal end and by the first inner end **202** and the second outer end **204**. The central portion **206** or band has a concave outer surface **210** and the inner surface **208** forms a conforming surface that is convex when viewed from within the spiral. The concavity of the band is parabolic in one variation with the inflection point being midway between the top end **212** and the bottom end **214** although the invention is not so limited and the inflection point may be anywhere between the top end **212** and the bottom end **214** and even coincident or nearly coincident with the top end **212** or bottom end **214**. The band **206** may also not have a concavity and may be simply curved or straight along at least a portion of the guard **200** between the top end **212** and the bottom end **214**. The guard **200** is shown to be symmetrical having a top end that has the same outer diameter as the bottom end. In another variation, the guard **200** is asymmetrical in shape and may have a top end larger or smaller in diameter relative to the bottom end. The guard **200** is also vertically symmetrical; however, the invention is not so limited and the guard **200** may have a central axis that is angled with respect to a reference horizontal plane. The guard **200** has a spiral shape such that a portion of the band overlaps another portion of the band in a curved, circular or elliptical fashion. In particular, at least a portion of the outer surface **210** of the band **200** overlaps and faces at least a portion of the inner surface **208** of the band **200** such that the concavity of part of the band **200** is adjacent or juxtaposed to a concavity of another part of the band seating and nesting a part of the band within the other part of the band. The spiral is shown to have a resting and mechanically unstressed configuration having one and a half turns with a circumferential length of approximately **37**R where R is the radius taken perpendicular to the longitudinal axis of the guard **200**. The invention is not limited to the guard **200** having precisely 1.5 turns and may have more or less turns as desired according to its size, shape and desired force distribution for a particular incision size and function such as a retractor function and/or retention function. A particular advantage of the spiral guard **200** is that its shape and size and be changed, expanded or reduced. In essence, the band can slide relative to itself to form a larger spiral form having a larger diameter or a smaller spiral form having a smaller diameter. The spiral guard **200** includes a central lumen **216** formed by the spiral which can also be enlarged as the spiral is expanded or opened up. The size of the central lumen **216** may also be reduced as the spiral is closed or reduced in size by sliding the band into a tighter curl upon itself producing a greater number of turns versus a larger curl that would produce a larger diameter with a smaller number of turns. The central lumen **216** is substantially circular in shape; however, the invention is not so limited and the central lumen **216** may be elliptical or irregular in shape. As such, the spiral shield **200** is adjustable when inserted into the wound of a patient or an incision or a bag placed inside a patient as described above with the other guards. Depending on the size of the incision, the spiral shield **200** can be adjusted larger or smaller by opening or closing the spiral shape, curling the guard onto itself make more turns to fit the wound opening or bag accordingly. Furthermore, the spiral shield **200** may be molded with a predetermined bias for a particular resting or normal diametrical position, shape and size. For example, if an incision of approximately one inch is made into the patient, a spiral shield **200** having a resting diameter of approximately two inches may be reduced in size by twisting the shield onto itself to increase its windings upon itself, thereby, decreasing its diameter. While in the reduced configuration, the spiral shield **200** is inserted into the one inch incision and then released. Whereas because of the bias molded into the spiral shield **200**, the spiral shield **200** will tend towards its normal configuration and, therefore, expand from its reduced configuration and advantageously retract the incision at the same time as well as seal or force against the incision holding the spiral shield **200** and anything between the shield **200** and the incision such as a bag in position with respect to the patient. Alternatively, the shield **200** may advantageously be reduced under force of the tissue when inserted into the incision. The force of the tissue upon the shield may reduce the diametrical size of shield. Because the shield is adjustable, the central opening or lumen **216** may be increased in size by opening up the spiral for the removal of larger specimens. This adjustability advantageously reduces the strain on surrounding tissue, keeps the incision site as small as possible, reduces the risk of infection and at the same time allows the incision size to be retracted and increased by opening up the spiral as needed to pull the specimen out of the body. Sometimes the size of the tissue to be removed is unpredictable and this adjustability advantageously allows for ease of removal of a wider range of tissue specimens without creating difficulties for the doctor.

The position of the spiral shield **200** is further advantageously retained with respect to the incision site or natural orifice such as the vagina with the help of the curvature or concavity of the band. In particular, the top end **212** forms a top lip also called a top flange that at least in part circumferentially extends onto the upper surface of tissue. The bottom end **214** forms a bottom lip or bottom flange that at least in part circumferentially extends onto the under surface of the tissue inside the patient cavity, abdominal wall or surgical working space advantageously retracting tissue away from the shield **200** cutting surface which is generally the inner surface **208** of the band. The tissue is received against the outer surface **210** of the band and is seated within the concavity or curved shape of the outer surface **210** keeping the shield and containment bag in place with the flanges preventing the shield from slipping down into the patient or slipping up and out of the patient. Of course, the shield **200** is placed directly within a surgical incision/orifice or within any one or more of the containment bags and wound retractors described above. Morcellation can proceed in any technique or fashion chosen by the surgeon including employing the inner surface **208** of the shield **200** as a cutting board against which a blade may be used to cut tissue pulled through or into the central lumen **216** with a grasper. As the tissue to be morcellated is pulled up through the central lumen **216**, it can be positioned against the inner surface **208** of the guard **200** and a blade or scalpel can be used to cut the tissue against the shield **200**. The shield **200** is manufactured of a suitable material such as any polymer or metal. One suitable material is ultra-high molecular weight polyethylene plastic. Another suitable material is low linear density polyethylene. The shield material has a thickness optimized for protecting the tissue without being punctured or severed easily when tissue is cut against it. When morcellation is completed, the spiral shield **200** can be reduced in diameter by winding the shield upon itself into a reduced configuration for easy removal from the surgical site. Alternatively, the shield **200** can be removed by pulling the shield **200** vertically or along the longitudinal axis of the shield.

FIGS. **52-53** illustrate the spiral shield **200** on a core pin of a forming mold **220** that has a helical shape. To manufacture the spiral shield **200** by injection molding, the shield **200** is molded onto a helical mold **220**. Once unwound off the core-pin of the mold **220**, the shield **200** can be conformed into its functioning spiral form by tucking one end in front of or behind the adjacent winding. Because the shield **200** is initially molded into a helix, and then conformed into a spiral, it has some spring-back tension memory within it making it want to assume a helical shape instead of staying as a perfect spiral. If the shield **200** has an undesirable and excessive amount of spring-bias tension, an annealing process can be performed by placing the shield **200** into an oven at the appropriate temperature for an allotted time and then removed and, thereby, reducing or alleviating any remnant tension in the shield **200**. However, in one variation of the shield **200**, some remaining tension is advantageously desirable as the tendency of the shield **200** to expand along a longitudinal axis facilitates removal of the device from the incision site. A tab (not shown) may be formed on one end of the shield **200** such as the proximal end, inner end or outer end and/or a hole may be formed near one end of the shield through which a pull string may be attached so that the string or tab may be pulled by the practitioner to easily remove the shield **200** from the incision site. The tab or hole may indicate a directional preference for inserting the shield so that the helical tension may be taken advantage of when removing the device with the tab/hole residing proximal to the surgeon outside the patient. In one variation, the first inner end **202** that is conformed to the inside of the winding would be tabbed or holed for this removal feature. During removal when the inner end **202** is pulled in a vertical direction, the band of the shield will progressively uncoil out of the incision site.

As an alternative to injection molding, the spiral shield **200** may be manufactured from plastic sheet stock, die cut and thermoformed into shape. Also, instead of injection molding the shield **200** into a helix, the spiral shield **200** may be injection molded in the shape of the spiral directly.

Turning now to FIGS. **71**A and **71**B, there is shown a shield **200** in an expanded elongate configuration and a compressed or unexpanded configuration, respectively. The expanded configuration of the shield **200** is also illustrated in greater detail in FIGS. **72-74**. The shield **200** in the expanded configuration is convertible into the compressed configuration by overlapping the inner surface **208** onto the outer surface **210**. The compressed configuration of the shield **200** is also illustrated in FIGS. **76-79**. At least part of the shield **200** overlaps itself in the unexpanded configuration as shown clearly in FIGS. **78**A-**78**C. In FIG. **78**C, the nesting of one part of the shield **200** in the concavity of the outer surface **210** of an adjacent overlapping portion of the shield **200** is shown. The shield **200** is adapted to be rolled or curled at least in part around the longitudinal axis **218**. The shield **200** is adapted to be rolled or curled at least in part around the longitudinal axis **218** onto itself such that a portion of the shield **200** overlaps or lies in juxtaposition or in contact with another portion of the shield **200**. When in the unexpanded configuration of FIG. **71**B, the shield **200** has a relaxed or normal lateral configuration in addition to a compact configuration in which the unexpanded configuration is rolled into a tighter roll having a reduced diametrical or lateral dimension suitable for insertion into a wound or orifice. The shield **200** has a bias towards the relaxed or normal lateral configuration and will tend toward this bias after insertion into a wound or orifice providing some retraction forces on the tissue as the shield **200** expands from the compact configuration to a larger configuration depending on the material used for the shield **200** and the forces exerted by the surrounding tissue in response to the inserted shield **200**. If the wound or orifice is tight, the shield **200** may not expand from its reduced lateral insertion configuration or may only slightly expand in the lateral dimension unrolling slightly as it tends towards its normal relaxed configuration or the shield **200** may expand all the way to its normal relaxed configuration.

The vertically expanded configuration of the shield **200** shown in FIG. **71**A is a result of it being molded onto a helical mold **220**. The shield **200** defines a longitudinal axis **218** about which the shield **200** is centered. The shield **200** is made of a material that is biased at least in part toward the vertically expanded position. The shield **200** may also be made of shape-memory material or include parts made of shape-memory material. When in the vertically compressed configuration, the bias to the vertically expanded position will not result in shield **200** springing into the vertically expanded configuration because the concavity of the outer surface forms a top lip also called a top flange **222** and a bottom lip also called a bottom flange **224** such that at least a portion of the top flange **222** abuts an adjacent overlapping top flange **222** while in the compressed configuration and at least a portion of the bottom flange **224** abuts an adjacent overlapping bottom flange **224** while in the compressed configuration preventing the vertically compressed configuration from easily popping into a vertically expanded configuration. At least one of the top flange **222** and bottom flange **224** serve as a stop preventing the shield **200** from expanding from the compressed configuration to the expanded configuration. The bias towards the expanded configuration imparts some friction onto the device itself which helps to adjust the lateral dimension or diametrical expansion of the shield **200**. When in the compressed configuration, the shield **200** can be rolled/curled about the longitudinal axis to reduce the diametrical or lateral dimension; thereby, reducing the size of the shield **200** as well as reducing the diameter of the central lumen **216** making it easier to insert through small minimally invasive incisions or orifices.

FIG. **80** illustrates the shield **200** in a relaxed or normal lateral configuration having approximately 1.25 times the circumference circumferential windings showing the central lumen **216** with a shield inner diameter or lumen diameter **226**, and shield diameter **228** or outer diameter either of which serve as a lateral or diametrical dimension for the shield **200**. FIG. **81** illustrates a top view of the shield **200**. In FIG. **81**, the shield **200** is in a compact configuration suitable for insertion into an incision/orifice in which the shield **200** is rolled into a tighter roll onto itself. The shield **200** in FIG. **81** has equal to or greater than approximately 2.25 times the circumference circumferential windings and a reduced lumen diameter **226** and shield diameter **228** relative to the relaxed, normal configuration of FIG. **80**. The overlapping portions of the shield **200** contact each and act to slightly frictionally retain the reduced lateral dimension position; however, since the bias of the lateral dimension is towards the unstressed or relaxed radial normal configuration, the shield **200** will tend to the normal configuration. The compact configuration having a reduced lateral dimension is suitably adapted for insertion into a wound or orifice. From the compact configuration, the shield **200** will expand from a reduced lateral dimension position towards a normal, unstressed lateral dimension configuration when released when outside the wound or orifice. This expansion in situ may be limited by forces exerted by the tissue in response to the forces imparted by the inserted shield **200**. Although the shield **200** includes a central lumen **216** having a circular shape and diameter, the invention is not so limited and variations include a shield **200** having an elongate lumen **216** having a length that is greater than its width such as an oval or ellipse. As such, the outer perimeter of the shield **200** may or may not have a corresponding shape. In a variation in which the outer perimeter of the shield **200** has a shape that corresponds to the shape of the central lumen **216**, where the lumen **216** is circular, the outer perimeter of the shield **200** is also circular or if the central lumen **216** has an oval or elliptical shape, the outer perimeter of the shield also has an oval or elliptical shape.

As described above, the shield **200** includes a top flange **222** and a bottom flange **224** as part of the concave outer surface **210** of the shield **200**. While in a vertically unexpanded configuration, the shield **200** is generally symmetrical about a plane perpendicular to the longitudinal axis **218** in which case the top flange **222** and bottom flange **224** extend an approximately equal distance radially outwardly from the longitudinal axis **218** as shown in FIG. **77**. Turning to FIG. **79**, there is shown a variation of the shield **200** in which the shield **200** is not symmetrical about a plane perpendicular to the longitudinal axis **218**. In FIG. **79** the top flange **222** extends radially outwardly from the longitudinal axis **218** a distance greater than the bottom flange **224** extends radially outwardly from the longitudinal axis **218**. The shield **200**, thereby, forms an enlarged top flange **222** relative to the bottom flange **224**. The enlarged top flange **222** advantageously provides a larger surface area of protection for the surround tissue and/or containment bag as well as provides a larger cutting board surface for the surgeon to use when morcellating/reducing tissue.

Turning to FIG. **82**, there is shown a variation of the shield **200** having a finger pull or tab **230**. The tab **230** is shown integrally formed at or near the first inner end **202** of the shield **200**. The tab **230** extends from first inner end **202** and from the top end **212** of the shield **200** forming an extension adapted to be easily grasped by the user either with the user's fingers or with an instrument such as a grasper. In one variation, the tab **230** includes an aperture **232** configured to provide a location for the insertion of an instrument or finger. In another variation, there is no aperture **232**. The tab **230** is configured such that when it is pulled generally in the upwardly or proximal direction, the shield **200** will convert from the unexpanded configuration to the expanded configuration. Upwardly directed force applied at the first end **202** via the tab **230** results in the bottom flange **224** of the first end **202** being unhooked or dislodged from the adjacent lower flange **224** of the shield **200** separating the first end **202** from a nested position with the overlapping curvature of the adjacent shield **200** portion. As the proximal end of the tab **230** is being pulled upwardly it will lead the vertical expansion of the shield **200**, first resulting in the first inner end **202** moving out from the unexpanded configuration and leading the rest of the shield **200** progressively out of a nested juxtaposition of the unexpanded configuration and into a the spiral shape of a shield **200** in an expanded configuration. FIG. **82** illustrates a shield **200** in an unexpanded configuration and the tab **230** integrally formed with the shield **200**. In another variation, the tab **230** is a separate element attached by adhesive, staple or other fastener to the first end **202** of the shield **200**. In yet another variation, the tab **230** includes a tether attached to the shield **200** and in another variation the tab **230** is a tether and not an extension of the shield **200**.

Turning now to FIGS. **83-84**, there is shown a shield **200** with a lock **234**. The lock **234** is configured to lock the lateral or diametrical dimension of the shield **200** while it is in the unexpanded configuration. When the shield **200** is placed in situ, the forces of the surrounding tissue may force the lateral or diametrical dimension of the shield **200** to be smaller than desired. Although the shield **200** may include a relaxed normal configuration while in the unexpanded configuration, the built-in bias of the shield **200** may not be sufficient to overcome the forces of the surround tissue or may otherwise be less than surgeon preference for a particular procedure or for a particular instrument to be passed through the central lumen **216** or for a particularly large specimen of target tissue. In either case, the lock **234** is configured to lock and hold the lateral or diametrical dimension of the shield **200** substantially fixed and, in particular, to prevent reduction of the lateral or diametrical dimension because of force from the surrounding tissue. For example, if the shield **200** is to be inserted into an incision or orifice that is relatively smaller than the lateral dimension of the shield **200**, it is first reduced into a compacted configuration such as shown in FIG. **81**. While in the compacted configuration, the shield **200** is inserted into the wound or orifice. The forces of the surrounding tissue in response to the inserted shield **200** may be greater than the bias tending to return the shield **200** to an unstressed, relaxed normal configuration. In such a case, the surgeon may desire a larger central lumen **216** for the shield **200** or to retract the surrounding tissue. The surgeon will then unroll the shield **200** into a larger lateral or larger diametrical configuration and lock that position with the lock **234** provided on the shield **200**. In one variation, the lock **234** comprises a first notch **236** located a distance proximal from the first inner end **202** of the shield **200** and near the top end **212** and a second notch **238** located a distance proximal from the second outer end **204** of the shield **200** and near the top end **212**. The notches **236**, **238** are located in the proximity of where one end **202** of the shield **200** overlaps with the other end **204** of the shield **200** in the unexpanded configuration. The shield **200** is shown in an unlocked configuration in FIG. **83**. To lock the shield **200**, the shield **200** is expanded in the lateral dimension by unrolling the shield **200** to create a larger central lumen **216**. The first notch **236** is overlapped with the second notch **238** to lock the shield **200** in a fixed diametrical/lateral dimension position with the remainder of the shield **200** maintaining some degree of overlap circumferentially around the perimeter of the shield **200**. FIG. **84** shows the first notch **236** overlapped or interlocked with the second notch **238** in a locked configuration. While in a locked configuration, at least a portion of the first end **202** is located exterior to at least a portion of the second end **204** such that a portion of the inner surface **208** of the first notch **236** faces the outer surface **210** of the second notch **238**. To unlock the shield **200**, the notches **236**, **238** are unhooked from each other.

As described above, the shield **200** can be inserted into the wound or orifice by winding and/or squeezing it into a smaller diameter and then inserting it into the wound or shield. Insertion of the shield **200** may be facilitated with common surgical instruments such as a clamp or grasper. Once inserted, the shield **200** naturally opens slightly and the tissue yields to the outside of its form. In one variation, the shield includes a lock **234** that enables the shield **200** to be locked at a slightly larger diameter than it would naturally occlude to. The lock **234** includes notches **236**, **238** along the outer edge of the shield **200** near the first and second ends **202**, **204** where the spiraled material overlaps. These notches **236**, **238** overlap when in the locked configuration such that at least part of an inner end of the shield **200** is snapped to reside outside the outer end of the shield **200**. The exposed tabs of the lock **234** could be pinched into an overlapping condition which would provide the mechanical interlock point.

Turning now to FIGS. **85-86**, there is shown another variation of a lock **234** on the shield **200**. The lock **234** includes interlocking teeth. In particular, a first set of outer teeth **240** are formed on the outer surface **210** near the first inner end **202** of the shield **200** and a second set of inner teeth **242** are formed on the inner surface **208** near the second outer end **204** of the shield **200**. The first set of outer teeth **240** are located in the concavity near the first inner end **202** and extend substantially vertically. The second set of inner teeth **242** are located in the convexity near the second outer end **204** and extend substantially vertically. The outer teeth **240** and the inner teeth **242** may also be angled. In one variation, the teeth **240**, **242** are angled such that that they may more readily slide or ramp over each other when moving from a reduced lateral dimension to an increased lateral dimension. The angle of the teeth locks the ends together and prevents the shield **200** from being reduced in the lateral direction by force of tissue at the wound or orifice. The outer teeth **240** and the inner teeth **242** are configured to interlock with each other in order to prevent reduction of the lateral dimension of the shield **200**. A plurality of inner teeth **240** and a plurality of outer teeth **242** are formed along at least a portion of the perimeter near the first and second ends **202**, **204** so that the position at which the shield **200** is locked can be adjusted as needed and, hence, the lateral dimension can be fixed as desired. While the teeth **240**, **242** are shown located in the midline perpendicular to the longitudinal axis **218**, the invention may include teeth provided anywhere along the vertical dimension.

In another variation of lock on a shield **200**, the shield **200** is provided with a protuberance that extends from the inner surface. The protuberance may be shaped like a hook and configured to engage a notch or opening formed in an adjacent portion of the shield **200**. In one variation, the protuberance is near one of the first inner end **202** and second outer end **204** and the notch or opening is formed near the other one of the first inner end **202** and second outer end **204**.

The shield **200** guards the tissue surrounding a wound or orifice in the body from sharp objects such as blades and morcellators during surgery. The terms wound, orifice, incision, body opening are used interchangeably in the specification. The wound is generally a minimally invasive incised wound that penetrates through the abdominal wall for laparoscopic or other types of surgery. The shield **200** is a spiral spring in the expanded configuration comprising a ribbon of material formed into a spiral that when inserted into a wound or orifice generates an outward force. The shield **200** also retracts tissue within the wound or orifice providing an opening across the abdominal wall or through an orifice via the central lumen **216** which is generally circular in shape when viewed along the longitudinal axis **218**. In one variation of the shield **200**, the shield **200** is not curved but made by winding a ribbon of generally flat material into a cylindrical or conical form. In another variation, the curved ribbon shield **200** has a C-shape vertical profile when viewed from the side. The proximal and distal edges also called the top end **212** and the bottom end **214** are larger in diameter than the mid portion of the shield **200** forming a top flange **222** and a bottom flange **224**, respectively. This C-shape configuration advantageously cups the tissue at the wound opening and provides anchor-like securement so the shield **200** does not easily dislodge axially from the wound or orifice during normal use. In one variation, the C-shape is parabolic as shown in FIG. **75**. The vertex of the parabola is located in a plane perpendicular to the longitudinal axis **218**. In another variation, the vertex is between the top end **212** or bottom end **214** and the vertical midline.

Removing the shield **200** from the wound or orifice is accomplished by first disengaging any interlocking features **234** and then gripping the exposed inner corner of the shield **200** and curling it inwardly in the direction of the material's spiral and then pulling it upwardly along the longitudinal axis and out of the wound or orifice. The shield **200** advantageously cork-screws out into a helical form of the expanded configuration. The shield **200** may be pulled out by hand with fingers or with the aid of common surgical instruments such as a clamp or grasper. One variation of the shield **200** is made from cut-resistant, yet pliable plastic material. The material choice and thickness provide the protection features. The shield **200** is pliable enough to be inserted and removed yet rigid enough to remain secured and provide protection.

The shield **200** provides several advantageous features. One important feature provided by the shield **200** is that it protects surrounding tissue from sharp objects such as blades, scalpels and morcellators. The shield **200** also provides protection for a containment bag in which it is placed, thereby, preventing the containment bag from being pierced or cut by sharp objects ensuring that the containment of biological specimens is maintained with reduced risk of leakage. The top flange **222** provides a wide base or cutting-board like protection for tissue and bag surfaces surround the wound or orifice. The top flange **222** overlays, covers and protects tissue margin and/or the containment bag. The middle portion of the shield **200** also shields tissue at the wound or orifice and also protects the containment bag in which it is placed if a containment bag is employed. The middle portion further advantageously allows surgeons to reach deeply with a blade and cut tissue specimen closely at the midline horizontal plane perpendicular to the longitudinal axis or above and even reach distally beyond the midline plane of the shield **200** to cut the tissue specimen as the entire vertical length of the shield **200** provides protection to the surrounding tissue and containment bag.

Another advantage of the shield **200** is that it includes an anchoring feature. The shield **200** is advantageously configured to anchor itself within the wound and orifice via the C-shape design. The anchoring features makes morcellation procedures dramatically easier and faster because it does not require sutures or another hand to hold the shield **200** in place during a normal procedure. A dual-flange (top and bottom **222**, **224**) is provided for anchoring the shield **200** capturing tissue or the abdominal wall within the concavity of the C-shape. The shield has a distal anchoring member for location within a wound interior and a proximal anchoring member for location externally of a wound opening. A single flange, either a top or bottom, is also within the scope of the present invention. Furthermore, although the top flange **222** and the bottom flange **224** are shown to extend around the entire circumference of the top end **212** and the bottom end **214**, respectively, the invention is not so limited and either one or more of the top and bottom flange **222**, **224** may extend around at least a portion of the circumference. In such a variation, finger-like extensions may be formed in lieu of a circumferential bottom flange **224**. The fingers may easily flex along the longitudinal direction for easy insertion and then spring radially outwardly into an anchoring position under an abdominal wall or other tissue structure or orifice. Also, the top flange **222** may extend radially outwardly a greater distance than the bottom flange **224** as shown in FIG. **79** and vice versa to provide a larger cutting-board-like surface.

Furthermore, the shield **200** is advantageously adapted for easy insertion and removal into and out of a wound or orifice. The shield **200** includes vertically expanded and vertically unexpanded configurations imparting the shield **200** with vertical variability. This makes the shield **200** easy to remove by simply pulling one end of the shield **200** proximally such that the shield **200** unhooks from adjacent and overlapping flanges and/or concavities and corkscrews into an expanded spiral shape from a nested unexpanded configuration. A tab, hole, and/or tether **230** is provided to help with grasping the shield **200** to pull vertically. Furthermore, while in the nested or unexpanded configuration, the shield **200** is movable into a compact configuration by rolling or curling the shield **200** onto itself to form a smaller or tighter circle and more revolutions about itself. The shield **200** advantageously moves from the laterally compact configuration by releasing the compacted configuration whereupon it assumes the normal relaxed configuration which has a relatively greater lateral dimension. A further increased configuration is also provided by shield **200** wherein a lateral or diametrical position larger than the normal or relaxed configuration can be locked in position via a lock **234** formed in the shield **200**. The lateral variability of the shield **200** allows the lateral dimension to be reduced for easy insertion into the wound or orifice. Also, from a locked, diametrically-increased position, the shield **200** may be unlocked and reduced in size in the lateral direction by simply unlocking the shield and/or unlocking the shield and then curling the shield upon itself into a tighter configuration making it easy to remove from the wound or orifice.

Also, the shield **200** is advantageously self-deploying. After curling the shield **200** into a compacted lateral configuration, the shield **200** is easily inserted into the wound or orifice and then released whereupon it tends to increase in size due to its spring bias. This spring-back action in the lateral direction helps to automatically seat the shield **200** within the wound or orifice with little effort while at the same time providing protection and retraction to the tissue and/or containment bag keeping both out of the way of sharp objects that may be encountered in a normal procedure.

Furthermore, while in the vertically unexpanded configuration, the shield **200** has a C-shaped or hourglass overall outer shape wherein the proximal end flares radially outwardly from the longitudinal axis and the distal end of the shield **200** flares radially outwardly from the longitudinal axis with the waist being the narrowest lateral dimension along a plane between the proximal end and the distal end of the shield. The flare at the distal end of the shield **200** advantageously provides a ramped surface or funnel that facilitates guiding and moving targeted tissue into and through the shield **200**.

The flexibility of the shield **200** allows it to excel at insertion, deployment, removal and being an anchor due to expansion. The flexibility is advantageously balanced against its ability to provide protection to the surrounding tissue and/or containment bag. The protection that the shield **200** provides is sufficient for manual morcellation procedures when performed properly while affording the surgeon freedom to employ personal morcellation techniques. The shield **200** is inserted into the mouth of a containment bag and may also be placed in the neck of a containment bag or in the main receptacle of the containment bag. The containment bag surrounds the shield **200** and is captured between the tissue/orifice and the shield **200**. The shield **200** serves to retract the surround tissue as well as the surrounding containment bag material. The shield **200** exerts sufficient force onto the containment bag such that the containment bag is kept in position substantially fixed such that it does not slide into the wound or orifice. A sufficient amount of the proximal end of the bag is located proximal to the shield and overlays the external surface, such as the abdomen, of the patient forming a blanket that helps prevent contamination. The shield **200** is configured to hold the mouth of the containment bag in an accessible, open configuration and receive and support a manual or power morcellator device.

In another variation, the shield **200** is adapted for insertion into the vaginal canal and as such is longer in length as shown. The shield **200** may also include shape-memory parts to assist in deployment. The shield **200** provides for a reliable and safe removal of endogenic samples and is easy to use reducing operating time and costs. The shield **200** in combination with a containment bag aids in reducing the risk of contaminating healthy tissue by possibly malignant cells during the tissue sampling and removal operations.

With reference to FIGS. **54-59**, a bag **310** according to the present invention will now be described. The bag **310** includes a single opening or mouth **312**. At or near the mouth **312** of the bag, a semi-rigid, compressible plastic ring **314** is connected into the bag **310**. The ring **314** can be compressed from a circular or large configuration into an oval or smaller configuration such that the bag **310** can be inserted through the small incision. Once inside the patient, the resilient ring **314** expands to its original uncompressed, larger configuration opening the mouth **312** of the bag **310** along with it. When laid flat inside the patient, the ring **314** clearly defines the opening **312** of the bag **310** which without a ring **314** may be difficult to see under laparoscopic observation. Sometimes the opening **312** to the bag **310** may be difficult to find. The opening **312** must then be oriented inside the patient so that tissue can be clearly placed into it and not placed past the opening **312**. In the present invention, the expanded ring **314** when laid on top of the bag **310** ensures that the any tissue placed within the ring **314** will end up inside the bag **310** when the ring **314** is lifted toward the incision. The empty bag **310** lies flat on a flat surface and the ring **314** falls naturally above the bag **310**. The resilient ring **314** allows the bag **310** to remain open without assistance inside the abdominal cavity to ease the capture of tissue.

After a tissue specimen is placed inside the ring **314**, the ring **314** is pulled up toward the incision. A tether **316** is provided near the mouth **312** of the bag **310** to assist the surgeon in pulling the bag **310** up towards the incision. The tether **316** may have a tag **318** at the proximal end which is retained outside the patient when the bag **310** is placed inside the patient. The tag **318** is also easily found inside the patient. The large tag **318** helps to quickly locate and pull the tether **16** when needed. The tether **316** may also be configured to cinch the bag **310** closed in order to prevent the contents of the bag **310** from spilling out. Alternatively, there may be an additional cinch string connected to the bag **310** and located beneath or above the ring **314** such that the cinch string circumferentially closes the bag. Other ways to close or seal may also be provided such as a press fit or zipper.

When the bag **310** is pulled and located near the incision, the ring **314** is compressed from its expanded configuration to its compressed configuration so that it can be pulled through the small incision. The ring **314** is compressed with a grasper or by hand through the incision opening. After the ring **314** is pulled through the incision, a sufficient amount of the bag **310** is pulled along with it so as to be laid over and cover a portion of the patient's abdomen. Hence, the bag **310** must be pretty large in order to create an apron effect around the incision outside the patient. With the ring **314** and part of the bag **310** outside the patient, the remainder of the bag **310** and tissue specimen remains inside the patient.

The cross-section of the ring **314** may be circular and may have a hollow center to impart flexibility. In one variation, the ring **314** has an elliptical, elongate or oval cross-section. In the variation shown in the figures, the ring **314** has a shape resembling the number eight or having two connected circular cross-sections which result in a small valley **320** between the circles. In general, the cross-section of the ring **314** has a length greater than its width. This elongated cross-section allows the ring **314** to be rolled or flipped over itself by inverting the ring **314** outwardly or inwardly to roll up the bag **310** onto the ring **314** itself. The ring **314** can be rolled in the opposite direction to unfurl the bag **310** from the ring **314**. The elongate cross-section of the ring **314** advantageously keeps the bag **310** sidewall rolled-up onto the ring **314**. If the cross-section were circular, the ring **314** may more easily roll and, thereby, unravel the rolled-up sidewall of the bag **310**. The rolling of the ring **314** about itself draws the bag **310** upwardly and brings the specimen inside the bag **310** closer to the incision opening. The rolling action of the bag **310** reduces the volume of the bag **310** located inside the patient and also creates a nicely-formed and taut apron outside the patient. If the bag **310** is retracted too tightly, the ring **314** may warp. The tissue specimen is then pulled from the bag **310** by morcellating it with a blade or electronic morcellator into a size and shape that can be passed through the small incision and removed from the bag **310**. The sidewall **328** of the bag **310** may be rolled up onto itself to form a roll **330** located adjacent to the ring **314** for ease of deployment as shown in FIG. **59**. The ring **314** would be squeezed such that the compressed length of the ring **314** is aligned with the length of the roll **330** for easy insertion.

With particular reference to FIGS. **55-56**, the ring **314** is a formed from a single elongate piece **322** of plastic formed into a circle or other shape by bonding the free ends together. In another variation, the ring **314** is made of two or more pieces such as two semi-circles that together define a circle of the same radius. The ends are not connected but are retained in a normal curved configuration inside a sleeve at the mouth of the bag **310**. The multi-piece ring **314** makes compressing the ring **314** into a smaller configuration easier. A ring **314** is approximately 0.38 inches in height and 0.18 inches wide and approximately 38 inches long. The thickness of the material forming the ring **314** is approximately 0.18 inches.

With particular reference to FIGS. **57-59**, the bag **310** is formed from a single sheet **324** of material. The sheet **324** of material is folded lengthwise and heat sealed on the sides to form seams **326**. The weakest part of any bag **310** is the area around the weld seams **326**. As can be seen in FIG. **57**, there is no weld seam **326** at the bottom of the bag **310** where forces are most likely to concentrate when removing a specimen which makes the bag **310** have a greater critical strength. Also, the material of the bag **310** is made of 4.2 mil Inzii® film which is clear and allows the surgeon to see through the side of the bag **310** during surgery. Visibility through the bag **310** eliminates the need to puncture the side of the bag **310** to achieve visualization. The film is elastic and gives the bag **310** good retraction. The bag **310** may also be made of U-5746 rip-stop nylon with a polyurethane coating. The polyurethane coating makes the film air tight and heat sealable. The U-5746 is a military grade material that is stronger than the Inzii® film but has less retraction and is opaque. The bag **310** is approximately 16 inches long and 12 inches wide at the mouth **312**. The bottom of the bag **310** forms an angle of approximately 45 degrees with the sidewall **328** at a distance of approximately 12.4 inches from the mouth **312**. The bag **310** has a thickness of approximately 0.2 inches and at the seams **326**, the bag **310** is approximately twice as thick. In another variation, the bag **310** is a double bag having one bag located inside another bag to provide greater resistance to accidental punctures. In another variation, only a bottom portion of the bag **310** is reinforced with a double-walled construction. The bag **310** is leak-proof and prevents viral penetration.

As previously described, a shield may be provided and used in conjunction with the bag **310**. The shield that is inserted into the mouth **312** of the containment bag **310** after the bag **310** is placed inside the patient and pulled through the incision. The shield is made of thicker plastic and protects the plastic bag **310** from being inadvertently cut by the blade used by the surgeon to morcellate the target tissue. The shield may also serve as a cutting board against which a surgeon may cut the target tissue if needed. The bag **310** may also be used with a retractor as described above wherein when the bag **310** is pulled through the incision, a retractor is placed inside the mouth **312** of the bag **310** and the tissue and bag **310** at the location of the incision is retracted before a shield is placed inside the retractor and the specimen removed.

With reference to FIGS. **60-63**, a bag introducer or fork **410** is used to introduce a containment bag **310** into a body cavity of a patient through a small incision. The introducer **410** facilitates placement of a bag **310** into the surgical field. The fork **410** has a proximal end **412** and distal end **414**. A handle **416** is provided at the proximal end **412**. A first prong **418** and a second prong **420** extend distally from the handle **416** forming a substantial fork-like configuration. The prongs **418**, **420** are of equal length. The prongs **418**, **420** may have any suitable cross-section and are spaced apart from each other by a sufficient distance. The prongs **418**, **420** are made of stainless steel and are connected to an injection molded plastic or metal handle **416** as shown in FIG. **60**. In this design, the steel rods comprising the prongs **418**, **420** are inserted into and connected to an injection molded handle **416** which allows for a fork **410** with a small profile but is more expensive to and takes longer to produce. In FIG. **61**, the fork **410** is made from a single piece of material wherein both the handle **416** and prongs **418**, **420** are injection molded to form a unitary structure. This design is the easiest and least expensive to manufacture at the cost of a larger profile and weaker design.

In use, and with particular reference to FIGS. **62-63**, the bottom of the containment bag **310** is placed between the prongs **418**, **420** with the tether **316** and tag **318** placed near the handle **416**. The bottom edge of the bag **310** is folded over the prongs **418**, **420** with the prongs extending slightly past the end of the bag **310**. Hence, the prongs **418**, **420** are slightly longer than the width of the bag **310**. The handle **416** is grasped and rotated allowing the bag **310** to roll up evenly into a tubular roll **330** until resistance is met. The bag **310** is reduced to a minimum size for introduction in the incorporeal region. The resilient ring **314** is squeezed and the bag **310** is rolled up until it is taut and located next to the ring **314**. Under visualization, the bag **310** and fork **410** combination is inserted through the incision ensuring the opening **312** of the ring **314** is positioned upwards. The bag **310** is inserted until it is approximately three-quarters into the incision. The fork **410** is rotated in the opposite direction to slightly loosen the bag **310**. The bag **410** is loosened to reduce the tension on the bag to make it easier for tissue to fall into the bag **310**. The fork **410** allows the bag **310** to be easily deployed while controlling how tight of the bag **310** is wound during insertion and the direction of the ring opening **312**. If the bag **310** is wound too tightly, then the tissue will not fall easily into the bag **310** when the ring **310** is lifted inside the patient. Rotation of the introducer **410** in the opposite direction before removal of the introducer **410** facilitates ease of tissue insertion into the bag **310**.

The fork **410** is separated from the bag **310** by pulling the handle **416** proximally. The remaining quarter section of the bag **310** is pushed into the incision. After the bag **310** is fully deployed in the abdominal cavity, an access port and scope are placed and the cavity is insufflated. The bag **310** is positioned such that the ring **314** lies on top of the bag **310**. The access port may be placed in the same incision or in a secondary incision. Under visualization, the tissue to be morcellated and removed from the patient is placed into the bag **310**. A lateral access port can be used to visualize and confirm that the tissue is inside the bag **310**. The access port is removed and the removal of the bag **310** out of the patient is commenced. A secondary access port need not be removed and may be used to continue observation of the removal and subsequent morcellation. The tag **318** may be resident outside of the patient. It is pulled to draw the bag **310** up toward the incision. If the tag **318** is inside the cavity, visualization through the access port and a grasper may be employed to grab the tag **318**. The tether **316** and tag **318** are pulled-up through the incision until part of the ring **314** is through the incision. The ring **314** is pulled until the entire ring **314** is outside of the incision. The bag **310** is retracted by rolling/flipping the ring **314** over itself to roll the bag **310** around the ring **314**. This rolling of the ring **314** not only retracts tissue slightly, but also, reduces the volume of the bag **310** inside the patient drawing the tissue inside the patient closer to the surface. The tissue is then morcellated.

Alternatively, a retractor having a central lumen is placed inside the mouth of the bag **310** at the incision and tissue along with the bag **310** is retracted enlarging the opening and then the tissue is morcellated with the bag **310** in place. The retractor having a central lumen is placed inside the mouth of the bag **310** in the location of the incision and a shield as previously described is provided and used in conjunction with the bag **310** and the retractor. The shield is placed inside the central lumen of the retractor. Of course, the shield may be used without the retractor. If a retractor is not used, the shield is placed into the mouth **312** of the bag **310** in the location of the incision. The shield is inserted into the mouth **312** of the containment bag **310** after the bag **310** is placed inside the patient and pulled through the incision. The shield is made of thicker plastic and protects the plastic bag **310** from being inadvertently cut by the blade or other instruments used by the surgeon to morcellate the target tissue. The shield may also serve as a cutting board against which a surgeon may cut the target tissue if needed. The shield itself may also function as a retractor having a first reduced dimension and a second expanded dimension. The second expanded dimension serving to retract tissue.

If a retractor is used inside the bag **310**, the retractor advantageously not only retracts the tissue but also retracts part of the bag, keeping the bag out of the way of a morcellating blade and, thereby, protecting the bag from cuts and punctures. A typical retractor includes a top ring and bottom ring with a flexible sidewall connected therebetween. The bottom ring is inserted through the incision and resides inside the patient whereas the top ring of the retractor resides above the patient. The top ring is rolled/flipped over itself like the bag to pull the lower ring of the retractor closer and the sidewall into a taut relation between the rings. The lower ring of the retractor advantageously retracts the portion of the bag **310** inside the patent and away from potential damage arising from punctures and tears from the blade.

The tissue is morcellated in a fashion desired by the surgeon. Generally, a small part of the target tissue is pulled to the outside of the patient while the larger portion of the target tissue remains inside the patient. The surgeon will take a blade and make a circumferential cut of approximately 180 degrees or 360 degrees around the circumference of the protruding tissue without severing the protruding tissue from the remainder of the target tissue. Keeping the protruding tissue intact with the larger piece inside the patient permits the surgeon to continue to grasp the tissue without losing it inside the bag. The surgeon pulls the grasped tissue little-by-little out of the patient making periodic circumferential cuts of any size so that more of the tissue can be pulled out until the entire piece of target tissue is removed. The result is a single elongated piece of removed target tissue instead of multiple small pieces. If not removed in one piece, the target tissue is removed in fewer pieces and in a more controlled manner. The bag **310** may be further retracted in between morcellations to bring the specimen closer to the surface. Once the tissue remaining in the bag **310** is small enough to easily fit through the incision, the bag **310** is completely removed.

Turning now to FIGS. **64-65**, there is shown another shield **510** according to the present invention. The shield **510** comprises a first ring **512** at the proximal end **514** and a second ring **516** at a distal end **518**. The rings **512**, **516** are substantially parallel to each other and are interconnected by a sidewall **520**. The sidewall **520** is a fabric, sheath material that can be made of flexible textile or polymer. The material can be Kevlar®, Dyneema®, rip-stop nylon, or polymer blend material. The sidewall **520** is heat sealed or bonded to the rings **512**, **516**. The first and second rings **512**, **516** are semi-rigid and compressible between a normal, high-profile, large configuration and a compressed, low-profile, elongate configuration. The rings **512**, **516** are generally circular in their normal configuration or can be elliptical. The rings **512**, **516** can be compressed from a circular or large configuration into an oval or smaller configuration such that the shield **510** can be inserted into a small incision, in particular, into the mouth of a containment bag to protect it. In one variation, only the second ring **516** is compressible for insertion into an incision and the first ring **512** is rigid such that the first ring **51** is intended for residency outside or proximally relative to inside the patient. The rigid proximal first ring **512** may be larger and wider in order to serve as a larger shield or cutting board for morcellation. The second or distally placed ring **516** is of flexible suitable for compression and easy insertion into a bag and may be slightly smaller in diameter than the first ring **512**.

The cross-section of one or more of the rings **512**, **516** may be circular. The rings **512**, **516** have a hollow center to impart flexibility. In one variation, the rings **512**, **516** have an elliptical, elongate or oval cross-section with a hollow center. In another variation, the rings **512**, **516** have a shape resembling the number eight having two connected circular cross-sections which result in a small valley between the circles as shown in FIGS. **55**A-**55**B. In general, the cross-section of the rings **512**, **516** has a length greater than its width. This elongated cross-section allows each ring **512**, **516** to be rolled or flipped over itself by inverting the ring **512**, **516** outwardly or inwardly to roll up the sidewall **520** onto the ring **512**, **516**. In one variation, only the first ring or proximal ring **512** is configured for rolling up the sidewall **520**. In another variation, both of the rings **512**, **516** are configured for rolling making the shield **510** bi-directional, that is either the first ring **512** or the second ring **516** can be placed proximally relative to the incision/orifice and rolled. The shield **510** is inserted by compressing one or more of the rings **512**, **516**. While both rings **512**, **516** may be compressed into the low-profile configuration for easy insertion through the incision, generally only the distal ring needs to be compressed with the proximal ring residing outside of the patient not needing to be compressed. Also, only the proximal ring need be configured for rolling the sidewall **520** as the distal ring resides inside the patient. The one or more rings **512**, **516** configured for rolling can be rolled in the opposite direction to increase the length of the sidewall **520**. When one of the rings **512**, **516** is rolled, the length of the sidewall **520** is taken up onto the ring shortening the length of the shield **510**. The elongate cross-section of the ring advantageously keeps the sidewall **520** rolled-up onto the ring. If the cross-section were circular, the ring may more easily roll in-situ and, thereby, unravel the rolled-up sidewall **520**. The rolling of the ring about itself draws the opposite ring upwardly and closer to it.

The rings **512**, **516** are formed from a single elongate piece of plastic formed into a circle or other shape by bonding the free ends together. In another variation, the rings **512**, **516** are made of two or more pieces such as two semi-circles that together define a circle for each ring. The ends are not connected but are retained in a normal curved configuration. A multi-piece ring makes compressing the ring into a smaller low-profile configuration easier. A ring is approximately 0.38 inches in height and 0.18 inches wide and approximately 38 inches long. The thickness of the material forming the ring **314** is approximately 0.18 inches. FIG. **65** illustrates the shield **510** placed inside a bag **310** and retracted by rolling the proximally located first ring **512** until the proximal rigid ring **512** is flush with the outer surface or abdomen of the patient. The cut resistant material of the rings **512**, **516** as well as the sidewall **520** protects the bag **310**. Retraction by rolling the proximal first ring **512** advantageously causes the incision to stretch. The resulting larger incision allows for greater ease of manual morcellation. In another variation, the shield **510** is not configured to permit rolling of one or more of the rings **512**, **516** to reduce the length of the shield **510** and the sidewall of the shield **510** is made of protection material.

Turning now to FIGS. **66-67**, there is shown another shield **510** according to the present invention. This shield **510** is similar to the shield of FIGS. **64-65** in that it comprises a first ring **512** at the proximal end **514** and a second ring **516** at the distal end **518** interconnected by a flexible sidewall **520**. The sidewall **520** of the variation depicted in FIGS. **66-67** comprises a first layer **522** and a second layer **524** shown separated and laid flat in FIG. **67**. The first layer **522** includes a plurality of vertical slits **526** and the second layer **524** includes a plurality of vertical slits **528**. The first layer **522** is placed adjacent or in juxtaposition to the second layer **524** to form the lantern-like sidewall **520** such that the slits **526** of the first layer **522** and the slits **528** of the second layer **524** are offset such that they do not meet to create a break through the shield **510**. Instead, the overlapping layers **522**, **524** with their offset slits **526**, **2528** create a flexible yet strong sidewall **520** that resists penetration. Each of the first layer **522** and second layer **524** is a flexible or semi-flexible sheath that bends easily but is cut resistant. The layers **522**, **524** are flexible enough to ease insertion yet capable of retraction when placed inside the bag in the incision with or without flipping of the rings **512**, **516** as described above. In another variation, the slits **526**, **528** are not perpendicular to the top and bottom edges of the layers **522**, **524** as shown in FIG. **67**. Instead, slits **526**, **528** are angled with respect to the top and bottom edges. The overall height of the shield **510** is approximately 0.5-2.0 inches and the sidewall **520** is made of protection material.

Turning now to FIGS. **68-70**, there is shown another variation of a shield **530** according to the present invention. The shield **530** is made of flexible or semi-rigid plastic. The shield **530** includes a flange **532** is substantially planar and includes an opening **534** in the middle. From the opening **534**, a plurality of slits **536** extends from the circumference of the opening **534** outwardly into the flange **532** to increase the flexibility of the corner intersection. The flange **532** is sized and configured to fit inside a retractor if one is used. In particular, the flange **532** snaps under the top ring of a retractor to help hold the shield **530** in position.

The flange **532** is connected to a central tubular section **538**. The tubular section **538** includes a central lumen that extends between the opening **534** at the proximal end and extends to an opening **540** at the distal end. The tubular section **538** may also include a plurality of slits **542** that extend upwardly from the distal opening **540**. The shield **530** further includes two fingers, or elongate extensions **544**, extending downwardly from the tubular section **538** at an oblique angle defining a first configuration for the fingers **544**. The fingers **544** include a second configuration that is a reduced or compressed configuration as shown in FIG. **69** in which the fingers **544** are pressed together or folded toward the longitudinal axis to assume a lateral dimension that is the same size or smaller than the lateral dimension of the central tubular section **538**. The reduced configuration makes it easy to insert the shield **530** into an incision or orifice. When inserted past the abdominal wall, as shown in FIG. **70**, the fingers **544** are configured to advantageously spring back to the first configuration in which the fingers **544** spread outwardly at an angle. In this first configuration, inside the incision, the fingers **544** advantageously retract not only tissue, but also, the bag (not shown) into which it is inserted. The slits **542** impart further flexibility to the distal end of the central portion **538** allowing it to assume a narrower configuration when placed into the incision and then also snap back to its normal configuration which aids in the retraction of the bag and tissue. The height of the flange **532** and the central portion **538** is approximately 0.5-2.0 inches and the shield **530** is made of HDPE, LDPE, HYTREL®, or other suitable polymer or metal. Also, the shield **530** may include more than two fingers **544**.

Turning now to FIGS. **87-90**, there is shown a morcellation system **600**. The morcellation system **600** is device that allows for the bulk removal of body tissue or organs through a limited surgical opening in a safe way. The morcellation system **600** is substantially a closed system that prevents contamination of surrounding tissue with potentially cancerous cells resident in the target tissue during morcellation and extraction procedures. The morcellation system **600** includes a morcellator **602**, a containment bag (not shown), a tenaculum **606** and a shield **608**.

The containment bag may be any of the bag embodiments described herein. Generally, the containment bag includes a polymer pouch having a mouth or opening that is attached to a ring such that the ring encompasses the mouth opening. The ring is flexible and configured to be biased in an open configuration such that the mouth of the bag is held open by the ring to facilitate insertion of a specimen into the bag. The ring is flexible such that it can be compressed into a low-profile state making it easily insertable into a wound or orifice. The ring maintains an opening and allows the bag to be retracted by rolling the ring about itself to wrap the sidewall of the bag around the ring. A tether is attached to the ring or proximal end of the bag. The tether includes an attached tag for grasping with a surgical instrument.

The morcellation system **600** further includes a morcellator **602**. The morcellator **602** is a power morcellator. The morcellator **602** includes a cutting ring or annular blade **610** having a sharp distal end adapted to sever tissue. The annular blade **610** is mounted on a hollow cylinder **612**. The cylinder **612** is connected to a pneumatic or electric motor (not shown) via gears and configured to rotate about the longitudinal axis. The morcellator **602** includes an inner cylinder **614** having a flared or funnel-like proximal end that is connected to the morcellator housing **616**. The distal end **620** of the inner cylinder **614** extends to a location proximal to the annular blade **610**. The inner cylinder **614** defines a working channel or central lumen **618** of the morcellator **602**. The inner cylinder **614** prevents tissue that is pulled into the central lumen **618** from spinning within the morcellator **602**. The morcellator **602** further includes an outer cylinder **622**. The outer cylinder **622** coaxially encompasses the cutting cylinder **612**. The outer cylinder **622** has a proximal end that connects to or forms part of the housing **616**. The distal end **624** of the outer cylinder extends to a location proximal to the distal end of the blade **610**. The outer cylinder **622** includes an extension **626** at the distal end **624** of the outer cylinder **622**. The extension **626** extends slightly beyond the distal end of the blade **610**. The extension **626** prevents coring of the specimen that is morcellated.

The morcellation system **600** further includes a shield **608**. The shield **608** can be any of the shields **608** described herein and, in one variation, of the like described with respect to FIGS. **51-53** and **71-86**. The shield **608** has a general shape of a spiral when in a vertically expanded configuration. The shield **608** is collapsible into a low-profile, unexpanded configuration. The shield **608** can be moved from the expanded configuration to the unexpanded configuration and vice versa repeatedly as needed. The shield **608** is a band of flexible plastic having the form of a spiral in an expanded configuration. The shield **608** may also be made of thin flexible metal or other suitable material that prevents sharps from penetrating the shield **608**. The band extends between a first end and a second end and a top or proximal end **628** and a bottom or distal end **630**. The distance between the proximal end **628** and the distal end **630** is approximately the overall length **638** of the shield **608** while in the unexpanded or low-profile configuration. The shield **608** has an inner surface **632** and an outer surface **634** interconnected by a proximal end **628** and the distal end **634** and by the first end and the second end. The outer surface **634** is concave and the inner surface **632** forms a conforming surface that is convex when viewed from within the shield **608**. The outer surface **634** is substantially parallel to the inner surface **632**. The shield **608** defines a central lumen **636**. When in the low-profile, unexpanded configuration, the shield **608** is capable of being reduced laterally in size to have a relatively smaller lateral dimension. As described above, the shield **608** includes a relaxed normal position having a first lateral or diametrical dimension while in the low-profile, unexpanded configuration. The shield **608** also includes a reduced configuration while in the low-profile unexpanded configuration having a second lateral or diametrical dimension. The second lateral or diametrical dimension is less than the first lateral or diametrical dimension. The reduced configuration when in the unexpanded configuration is achieved by curling the shield **608** onto itself into a tighter and smaller configuration. This curling action reduces the size of the central lumen **636**. This reduced configuration is held fixed by hand or by a lock. Insertion of the shield **608** into a small incision or orifice is greatly facilitated by curling the shield **608** onto itself into a reduced configuration. When inserted into the incision or orifice, the shield **608** is then released and allowed to unwind from a tight curl toward the relaxed, normal position having a larger lateral dimension. However, forces from surrounding tissue may prevent the shield **608** from reaching the first lateral or diametrical dimension and, therefore, the shield **608** may reach a dimension that is equal to the second lateral dimension or equal to the first lateral dimension or have a dimension anywhere between the first lateral dimension and second lateral dimension. Furthermore, the shield **608** may be uncurled into an enlarged configuration having a third lateral or diametrical dimension. The third lateral or diametrical dimension is larger than the first lateral or diametrical dimension. The enlarged configuration may be locked in position with the shield **608** by way of any of the locks described herein that fix the position and the lateral or diametrical dimension of the shield **608**. This enlarged configuration may serve to retract tissue and enlarge the opening of the orifice or wound. The reduced configuration as well as the relaxed normal configuration and any position between the reduced configuration to the enlarged configuration may serve to retract tissue and hold the wound and orifice open while providing a working channel through the central lumen **636**.

With particular reference to FIGS. **87** and **88**, the morcellator **602** is shown inserted into the central lumen **636** of the shield **608**. The distal end of the morcellator housing **616** abuts the proximal end **628** of the shield **608**. The length **640** of the morcellator **602** that extends downwardly from the housing **616** and includes the blade cylinder **612**, the inner cylinder **614** and the outer cylinder **622** is approximately equal to the length **638** of the shield **608**. In one variation, the length **638** of the shield **608** is shorter than the extension **626** that protrudes from the outer cylinder **622**. FIG. **87** illustrates the extension **626** extending beyond the length of the shield **608**. In such a variation, the distal end of the shield **608** is just proximal to the extension **626**. In another variation, the length **638** of the shield **608** is equal to the distal end of the annular blade **610**. In another variation, the length **638** of the shield **608** is extends slightly distally beyond the blade **610**. In another variation, the length **638** of the shield **608** is distal to the extension **626**. The length **638** of the shield **608** is adapted to encompass the depending portion of the morcellator **602**, in particular, the blade **610**. By encompassing the blade **610**, the shield **608** and guards the blade **610** from inadvertent contact with the surrounding tissue and containment bag.

In use, a tissue containment bag is placed through a small incision in the abdomen or small orifice or opening in the body. This is accomplished by compressing the flexible ring of the bag into a low-profile configuration and inserting the bag through a small incision/opening. The flexible ring is allowed to spring open inside the body cavity and expand the mouth portion of the bag making it easy to place a severed piece of target tissue into the bag. The targeted tissue is placed into the bag while the bag is inside the abdominal body cavity. A retractor may be employed and placed inside the incision. The tether on the bag is then used to pull the ring of the bag through the incision. The ring on the bag is rolled over itself to roll the bag sidewall around the ring reducing the length and size of the bag and, thereby, to draw the specimen inside the bag closer to the incision/opening. The specimen inside the bag is visualized with the naked eye near the mouth of the bag. The shield **608** is rotated to minimize its size while outside the patient by rolling or curling the shield **608** onto itself into a tighter form. While in the reduced configuration, the shield **608** is placed into the bag within the incision/opening and allowed to expand on its own or is enlarged diametrically to maximize the incision opening by reversing the rotation of the shield **608**. The enlarged position may be fixed with a lock of the type described herein. The shield **608** is uncurled into a larger dimension. The C-shaped outer surface **634** of the shield **608** anchors nicely within the incision such that the abdominal wall is seated within the concavity of the "C". A tenaculum **606** is advanced through the central lumen **618** of the morcellator **602** and is used to grasp the targeted tissue during visualization of the targeted tissue with the naked eye. Once the tissue is properly grasped, it is held by the tenaculum **606** and the morcellator **602** is moved or slid down the length of the tenaculum **606** such that the depending portion of the morcellator **602** including the blade cylinder **612**, inner cylinder **614** and outer cylinder **622**, is passed into the central lumen **636** of the shield **608** until the distal end of the morcellator housing **616** abuts the proximal end **628** of the shield **608**. The tenaculum **606** may be pulled proximally such that the specimen comes into contact with the blade **610** of the morcellator **602**. The morcellator **602** is activated to rotate the blade cylinder **612** at a high speed. The tenaculum is withdrawn in the proximal direction while still grasping the specimen. The tenaculum is used to pull the grasped tissue into the cutting blade of the morcellator **602**. The extension **626** on the outer cylinder **622** prevents the full circumference of the blade **610** from cutting through tissue at the same time. This prevents coring and allows the blade **610** to migrate along the specimen yielding a greater portion of the specimen that is extracted in one piece. After all of the tissue has been removed or reduced to pieces having a size that may fit through the incision, the shield **608** and bag are removed. The shield **608** advantageously protects and retracts the adjacent tissue at the incision and guards against adjacent portions of the containment bag from contacting the cutting blade **610** accidentally. Also, the present invention avoids making secondary openings made in the containment bag in order to insert a scope and visualize the morcellation procedure. The secondary openings which may compromise the closed containment system are advantageously avoided by this morcellation system **600**. Morcellation within a body cavity may spread potentially harmful fragments of the specimen being morcellated. As such, morcellation within a closed system is desired. Placing the specimen in a containment bag creates a closed system when the opening of the bag is brought to the surface through an incision, thereby, isolating the specimen inside the bag and from coming into contact with tissue in the body cavity. Previous solutions for visualization have necessitated creating another opening the bag to place a laparoscope through the opening, thereby, no longer maintaining a closed system. Alternatively, a scope may be placed through the same incision as the morcellator, however, this results in poor visibility and triangulation needed for optimum viewing. The shield **608** advantageously permits a cutting mechanism including a power morcellator to be used within a closed system while preventing a potential breach to a contained system. The morcellation system **600** allows for visibility of the specimen without a laparoscope by bringing the specimen to the surface when the bag is retracted. The morcellation system **600** maintains and ensures a closed system throughout the morcellation procedure by mitigating damage to the tissue containment bag through the use of the shield **608** with a corresponding short morcellator. The shield **608** length is approximately equal to the length of the protruding portion of the morcellator **602**. The shield **608** surrounds the blade **610** and lies between the bag and the morcellator **602**. The shield **608** opens and retains the incision opening so that the specimen may be easily visualized and removed. The shield **608** protects the bag and the tissue at the incision site from being damaged by the cutting blade **610** or tenaculum **606**. The outer cylinder **622** of the morcellator is encompassed by the shield **608** which prevents incidental contact of the blade **610** with the containment bag that would possibly result in a breach of the closed system. The shield **608** forms a protective cage around blade ensuring safe morcellation. In one variation, the length **638** of the shield **608** in the unexpanded configuration is approximately one inch and the length **640** of the morcellator cylinder is also approximately one inch.

Turning now to FIGS. **89-90**, there is shown a morcellation system **600** that uses an energy-based morcellator **602**. The energy-based morcellation system utilizes the tissue containment bag, tenaculum, shield **608** in the same manner as described above. Rather than rotating the blade **610** to cut tissue, a circular blade **610** remains stationary. The blade **610** and cylinder **612** of the morcellator **602** are connected via an energy input **650** to the output of a monopolar energy system **652**. The tenaculum **606** is connected to a plug **654** leading to a ground on the monopolar energy system **652**. When the target tissue is grasped by the tenaculum **606** and brought to the blade **610**, the monopolar energy is engaged, cutting the tissue. The extension **626** serves the same purpose as mentioned previously. An evacuation port **656** is provided on the housing **616** to prevent inhalation of smoke from the cutting process.

Turning now to FIGS. **91-103**, there is shown a shield **700** adapted for placement within the vaginal canal. The shield **700** has a similar shape to the shields described herein. The shield **700** is substantially cylindrical/tubular in shape formed from a band of material having an inner first end **702** and an outer second end **704** interconnected between a proximal end **706** and a distal end **708**. The shield **700** includes an outer surface **710** and an inner surface **712**. The inner surface **712** defines a central lumen **714** that extends from the proximal end **706** to the distal end **708** along a longitudinal axis. The central lumen **714** is shown to be circular in shape and, in another variation, may also have an elliptical or elongate oval oblong shape. The proximal end **706** defines a radially outwardly extending proximal flange **716** that forms a funnel-like entryway to the central lumen **714**. The outer surface **634** is concave and flares progressively radially outwardly toward the distal end **708**. In another variation, the distal end **708** is not flared but is substantially cylindrical having a substantially constant diameter distally from the funnel-like flange **716** at the proximal end. At least a portion of the shield **700** overlaps onto itself when in a relaxed normal configuration. In another variation, the shield **700** does not overlap onto itself when in a relaxed configuration. The shield **700** can be curled onto itself to reduce a lateral dimension for ease of insertion into the vagina or other orifice or wound incision. The overlapping portions of the shield **700** conform and nest with each other. The shield **700** is configured such that one end such as the first end **702** slides against the second end **704**. The shield **700** is capable of having a first reduced lateral or diametrical dimension suitable for easy insertion into the vagina or other body opening. The reduced lateral position is achieved by curling the shield **700** onto itself into a tighter and smaller configuration. The shield **700** also includes a relaxed normal position having a second lateral or diametrical dimension. The second lateral or diametrical dimension is greater than the first lateral/diametrical dimension. The shield **700** is molded with a bias towards the normal relaxed position such that when reduced to the first diametrical position the shield **700** will tend to automatically expand or spring open, or uncurl towards its relaxed and normal position having the approximate second lateral or diametrical dimension. The shield **700** may be provided with a lock of the kind described herein that fixes the lateral or diametrical position. The shield **700** also includes an enlarged configuration having a third lateral or diametrical dimension. The third lateral or diametrical dimension is larger than the second lateral or diametrical dimension. The enlarged configuration is achieved by curling the shield **700** in the opposite direction or uncurling the shield **700** to open up the central lumen **714**. Any of the positions and any intermediate position of the shield **700** lateral dimension may be locked in position via the lock. The shield **700** and, particularly, the enlarged configuration of the shield **700** serves to retract tissue and open the orifice or wound to provide a safe working channel for surgical procedures.

As can be seen in FIGS. **93-94**, the first end **702** and the second end **704** each have an S-shape curvature that overlaps onto an outer surface **710** of an adjacent shield portion. The S-shape transitions into notches **718**, **720** near the proximal end **706** and the distal end **708**, respectively. The notches **718**, **720** form the lock configured to fix the lateral dimension of the shield **700**. The notches **718**, **720** are shown in an unlocked position in FIGS. **93-94** and in a locked position in FIGS. **97-98**. The notches **718**, **720** form finger-like extensions that are configured to mate with each other to lock the shield **700** in position. In FIGS. **97-98**, the finger-like extension near notch **718** of the outer second end **704** overlaps the inner first end **702** to lock the shield **700**. As described above, the outer surface **710** of the shield **700** forms a concave surface having a point of inflection **722** visible in FIGS. **93-94**. The inflection point **722** is located near the proximal flange **716** above the mid-plane taken perpendicular to the longitudinal axis. The proximal flange **716** serves as a protective surface that guards a containment bag, retractor **724** and vaginal canal tissue at the insertion location. The shield and/or the flange is made of hard, rigid, or semi-rigid, plastic or cut-resistant material. The proximal flange **716**, in particular, the inner surface **712** of the proximal flange **716** provides a cutting-board like surface against which sharps such as scalpels or blades can be advantageously used to cut and reduce targeted tissue for extraction and removal without fear of cutting the containment bag, adjacent tissue or retractor.

With particular reference now to FIGS. **99-103**, there is shown the shield **700** employed in combination with a retractor **724**. The retractor **724** is the same retractor **62** as described with respect to FIGS. **18-19**. The retractor **724** includes a first ring **726** and a second ring **728** interconnected by a flexible sidewall **730**. The sidewall **730** defines a central opening extending along the longitudinal axis of the retractor **724**. The second ring **728** can be compressed and inserted through the vaginal canal where it expands to create a securement against the vagina. The first ring **726** resides above the entrance to the vagina outside the patient where it can be rolled down to retract and enlarge the vaginal canal.

In a hysterectomy, the uterus is detached from the body via instruments inserted through abdominal ports. After the uterus has been detached, the shield **700** may be inserted directly into the vaginal canal. In such a variation, the shield **700** is curled upon itself into a reduced configuration to aid in the insertion of the shield **700** and when in position, the shield **700** is allowed to expand to its normal, relaxed configuration while inside the vaginal canal, thereby, expanding and retracting the vaginal opening. The proximal flange **716** resides near the entrance to the vagina. The detached uterus would be gasped and pulled into the central lumen **714** of the shield **700** against which it may be morcellated with a blade permitting the uterus to be reduced in size or pieces and completely removed through the vaginal canal.

In another variation, a containment bag is placed inside the abdominal cavity either through an abdominal port or through the vaginal canal. The removed uterus is placed into the containment bag. The tether of the containment bag is pulled through the vaginal canal. The ring of the containment bag is compressed into a low-profile configuration to facilitate pulling the proximal end of the containment bag through the vaginal canal. The ring of the containment bag is pulled outside the body and allowed to expand into an open configuration, thereby, opening the mouth of the containment bag. The ring of the containment bag resides outside the entrance to the vagina. The ring of the containment bag may be rolled-down to roll the sidewall of the bag onto the ring of the containment bag. This action brings the removed uterus inside the bag closer to the vaginal opening. The shield **700** is then inserted into the mouth of the containment bag and into the vaginal canal. The shield **700** may be curled down into a compact configuration to aid insertion. The proximal flange **716** resides at or near the entrance to the vagina. In one variation, the proximal flange **716** of the shield **700** is snapped under the ring of the containment bag. The removed uterus is gasped with a grasper and pulled into the central lumen **714** of the shield **700** where morcellation can commence.

The distal end of the shield **700** is funnel-shaped having a progressively increasing radial dimension from the point of inflection **722** toward the distal end **708** of the shield **700**. This funnel-like shape advantageously helps to move the detached uterus into the shield **700**. The uterus is morcellated with a blade while it is at least partially resident within the shield **700** before being completely removed in whole or in parts. The shield **700** advantageously protects the surrounding vaginal canal as well as the containment bag from the sharp blade helping to maintain the integrity of the containment bag and the closed morcellation system.

In another variation, the same procedure is carried out as in the previous paragraph but a retractor **724** is inserted into the mouth of the containment bag after the uterus has been placed into the containment bag and after the ring of the containment bag is pulled to outside the body. The second ring **728** of the retractor **724** is compressed for easy insertion into the mouth of the containment bag and then allowed to expand into an open configuration inside the containment bag in a location distal to the vaginal canal inside the abdominal cavity. The first ring **726** of the retractor **724** that is resident outside the body is rolled about itself to roll the sidewall **720** of the retractor **724** onto the first ring **726**. This action retracts not only the vaginal canal but also retracts the containment bag out of the way clearing the vaginal canal for insertion of the shield **700**. The containment bag is captured between the retractor and the vaginal canal keeping it in place and preventing its migration into or out of the vaginal canal. The shield **700** is then inserted into the central lumen of the retractor **724** that is residing inside the containment bag. The shield **700** may be curled down into a compact configuration if needed and then allowed to expand to self-anchor the shield **700** into position. The shield **700** is then connected to the first ring **726** of the retractor **724** by snapping the proximal flange **716** of the shield **700** under the first ring **726** as shown in FIGS. **99**-**103**. The uterus can then be grasped with a surgical instrument and pulled from the pouch of the containment bag into the central lumen **714** of the shield **700** where the uterus is morcellated with a blade while it is at least partially resident within the shield **700** before being completely removed in whole or in parts. The shield **700** advantageously protects the surrounding vaginal canal as well as the containment bag from the sharp blade helping to maintain the integrity of the containment bag and the closed morcellation system while providing the surgeon with a mechanism to perform morcellation safely and quickly.

In another variation, the same procedure is carried out in the same way as in the previous paragraph except that the retractor **724** is placed into the vaginal canal before the containment bag with the specimen inside is pulled through the vaginal canal. In this variation, the removed uterus is placed inside the containment bag located inside the abdominal cavity and the tether attached to the proximal end of the containment bag is pulled with a grasper through the central lumen of the retractor bringing the ring of the containment bag and mouth to the outside of the patient. The ring of the containment bag may then be rolled down to bring the detached uterus closer to the opening. Afterwards, the shield **700** is reduced in size laterally by curling the flexible retractor **700** onto itself into a compact configuration and then releasing the shield **700** allowing it to expand due to its bias tending it to expand laterally from the compact configuration. As the shield **700** expands it self-anchors and retracts the containment bag creating a working channel though the central lumen **714** of the shield **700** for moving and morcellating the detached uterus. The proximal flange **716** of the shield **700** may be snapped under the ring of the containment bag or first ring **726** of the retractor **724**. The containment bag is captured between the retractor **724** and the shield **700** keeping it from slipping proximally or distally during the procedure. The flange **726** may also serve as a cutting-board-like surface against which a sharp blade can be used to cut the uterus for removal. For all of the above hysterectomy procedures, the containment bag and retractor combination of FIG. **20** may be used in lieu of one or more of the containment bag and retractor **724**.

In yet another variation, the shield **700** is employed with a retractor **724** as shown in FIGS. **99**-**103**. In such a variation, the retractor **724** is placed into the vaginal canal. The uterus is detached employing standard techniques either before or after the retractor **724** has been placed in position. The second ring **728** of the retractor **724** is compressed for easy insertion into the vaginal canal and then allowed to expand into an open configuration in a location distal to the vaginal canal inside the abdominal cavity. The first ring **726** of the retractor **724** that is resident outside the body is rolled about itself to roll the sidewall **720** of the retractor **724** onto the first ring **726**. This action retracts the vaginal canal. The shield **700** is then inserted into the central lumen of the retractor **724**. The shield **700** may be curled down into a compact configuration if needed and then allowed to expand to self-anchor the shield **700** into position. The shield **700** is then connected to the first ring **726** of the retractor **724** by snapping the proximal flange **716** of the shield **700** under the first ring **726** as shown in FIGS. **99-103**. The uterus can then be grasped with a surgical instrument and pulled into the central lumen **714** of the shield **700** where the uterus is morcellated with a blade while it is at least partially resident within the shield **700** before being completely removed in whole or in parts. The shield **700** advantageously protects the surrounding vaginal canal as well as the retractor **724** from the sharp blade while providing the surgeon with a mechanism to perform morcellation safely and quickly.

Turning now to FIGS. **104-107**, there is shown another variation of a shield **800** adapted for use in the vaginal canal. The shield **800** includes a top end **802** and a bottom end **804** interconnected by a sidewall **806**. An opening **808** is formed in the shield **800** that extends through the top end **802** and the bottom end **804**. The shield **800** further includes a first flange **810** and a second flange **812**. The first flange **810** extends from the bottom end **804** in the distal direction. The first flange **810** is curved forming an elongate surface that is concave towards the longitudinal axis **816**. The first flange **810** may also be substantially flat elongate surface. The first flange **810** includes a distal end **814** that is angled away from the longitudinal axis **816**. The second flange **812** extends from the bottom end **804** in the distal direction. The second flange **812** includes a hook **818** that is configured to attach to a ring of a containment bag or a proximal ring of a retractor by snapping under the ring. FIGS. **106-107** illustrate the shield **800** connected to a retractor **724**. The retractor **724** is the same retractor as described above with respect to FIGS. **18-19** and FIGS. **99-103**. The retractor **724** includes a first ring **726** and a second ring **728** interconnected by a flexible sidewall **730**. The sidewall **730** defines a central opening extending along the longitudinal axis of the retractor **724**. The second ring **728** can be compressed and inserted through the vaginal canal where it expands to create a securement against the vagina cavity. The first ring **726** resides above the entrance to the vagina outside the patient where it can be rolled down to retract and enlarge the vaginal canal.

The shield **800** will now be described in use during a surgical procedure such as a hysterectomy even though the invention is not limited to use in a hysterectomy and can be applied to the removal or morcellation procedure of any targeted tissue. In a hysterectomy, the uterus is detached from the body via instruments inserted through abdominal ports.

In one variation, the shield **800** is employed with a retractor **724** as shown in FIGS. **106-107**. In such a variation, the retractor **724** is placed into the vaginal canal. The uterus is detached employing standard techniques either before or after the retractor **724** has been placed in position. The second ring **728** of the retractor **724** is compressed for easy insertion into the vaginal canal and then allowed to expand into an open configuration in a location distal to the vaginal canal inside the abdominal cavity. The first ring **726** of the retractor **724** remains resident outside the body and is rolled about itself to roll the sidewall **720** of the retractor **724** onto the first ring **726**. This action retracts the vaginal canal. The shield **800** is then inserted into the central lumen of the retractor **724** and connected to the retractor **724**. The shield **800** is connected to the first ring **726** of the retractor **724** by snapping the second flange **812** of the shield **800** under the first ring **726** from the inside of the first ring **726** as shown in FIGS. **106-107**. Additional hooks for connecting the shield **800** to the retractor **724** may be provided. The shield **800** covers or caps onto the first ring **726** of the retractor **724** and the one or more hook **818** hooks under the first ring **726** to secure the shield **800** to the retractor **724**. The uterus can then be grasped with a surgical instrument and pulled in the proximal direction and placed onto or in juxtaposition to the first flange **810**. The first flange **810** of the shield **800** is curved and advantageously cradles the detached uterus preventing it from slipping off the first flange **810** while a surgeon uses a blade to cut the uterus to reduce it in size for removal through the vaginal canal. The first flange **810** advantageously serves as a cutting-board like surface against which a blade can be safely employed to cut tissue resting near or in contact with the first flange **810**. The angled distal end **814** of the first flange **810** provides additional vaginal dilation and provides a ramp for moving and guiding the uterus into the vaginal canal and proximally toward the vaginal opening. At the proximal end of the shield **800**, the ring-like portion of the shield **800** advantageously retracts the labia safely out of the way of the morcellating blade. The uterus is morcellated with a blade while it is at least partially resident within the shield **800** before being completely removed in whole or in parts. The shield **800** advantageously protects the surrounding vaginal canal, the labia as well as the retractor **724** from the sharp blade while providing the surgeon with a mechanism to perform morcellation safely and quickly.

In another variation, a containment bag is placed inside the abdominal cavity either through an abdominal port or through the vaginal canal. The removed uterus is placed into the containment bag. The tether of the containment bag is pulled through the vaginal canal. The ring of the containment bag is compressed into a low-profile configuration to facilitate pulling the proximal end of the containment bag. The ring of the containment bag is pulled outside the body and allowed to expand into an open configuration opening the mouth of the containment. The ring of the containment bag resides outside the entrance to the vagina. The ring of the containment bag may be rolled down to roll the sidewall of the bag onto the ring of the containment bag. This action brings the removed uterus inside the bag closer to the vaginal opening. The shield **800** is then inserted into the mouth of the containment bag and into the vaginal canal and connected to ring of the containment bag by hooking the second flange **812** onto the ring to secure the shield **800** to the bag. The removed uterus inside the bag is gasped with a grasper and pulled onto the first flange **810** of the shield **800**. The angled distal end **814** of the first flange **810** helps guide and ramp the uterus into position and cradles the uterus for morcellation. The uterus is morcellated with a blade while it is at least partially located adjacent to the first flange **810** before being completely removed in whole or in parts. The shield **800** advantageously protects the surrounding vaginal canal as well as the containment bag from the sharp blade helping to maintain the integrity of the containment bag and the closed morcellation system.

In another variation, the same procedure is carried out as in the previous paragraph but a retractor **724** is inserted into the mouth of the containment bag after the uterus has been placed into the containment bag and after the ring of the containment bag is pulled to outside the body. The second ring **728** of the retractor **724** is compressed for easy insertion into the mouth of the containment bag and then allowed to expand into an open configuration inside the containment bag in a location distal to the vaginal canal inside the abdominal cavity. The first ring **726** of the retractor **724** is rolled about itself to roll the sidewall **720** of the retractor **724** onto the first ring **726**. This action retracts not only the vaginal canal but also retracts the containment bag out of the way clearing the vaginal canal for insertion of the shield **800**. The containment bag is thereby captured between the retractor **724** and the vaginal canal keeping it in place and preventing its migration proximally or distally along the vaginal canal. The shield **800** is then inserted into the central lumen of the retractor **724** residing inside the containment bag. The shield **800** is connected to the first ring **726** of the retractor **724** by snapping the second flange **812** of the shield **800** under the first ring **726** of the retractor **724**. The uterus can then be grasped with a surgical instrument and pulled from the pouch of the containment bag into juxtaposition with first flange **810** of the shield **800** where the uterus is morcellated with a blade while it is at least partially in contact with the first flange **810** before being completely removed in whole or in parts. The shield **800** advantageously protects the surrounding vaginal canal as well as the containment bag and retractor **724** from the sharp blade helping to maintain the integrity of the containment bag and the closed morcellation system while providing the surgeon with a mechanism to perform morcellation safely and quickly. For all of the above hysterectomy procedures, the containment bag and retractor combination of FIG. **20** may be used in lieu of one or more of the containment bag and retractor **724**. It is also understood that the invention is not limited to hysterectomy procedures and can be applied for the morcellation, reduction and removal of any tissue or organ.

Turning now to FIGS. **108-109**, there is shown a variation of a shield **900** that includes a funnel **902** having a retraction finger **904** at a distal end. The funnel **902** defines a central opening **906**. The proximal end of the shield **900** defines a funnel-like entry to the central opening and forms a proximal flange surface circumferentially surrounding the central opening **906**. The shield **900** is inserted into an orifice or wound incision by inserting the retraction finger **904** first and then inserting or angling the central portion of the funnel **902** into the opening. The proximal end of the funnel **902** is laid on top of the abdomen or other outer surface of the body. The proximal flange provides a cutting-board location against which tissue can be morcellated. The retraction finger **904** serves to retract the incision or orifice and helps keep the shield **900** anchored in position. The retraction finger **904** forms a distal flange that extends only around a portion of the circumference of the distal end of the central opening **906**. The retraction finger **904** is curved such that the side profile of the shield **900** in the location of the retraction finger **904** is substantially C-shaped wherein the upper part of the letter "C" extends laterally a greater distance relative to the lower part of the "C". Also, the funnel **902** provides protection to the surrounding tissue and containment bag and retractor if employed together with the shield **900**. For example, a containment bag may be inserted through the orifice or incision and the mouth of the bag pulled back out of the incision after a specimen has been inserted into the bag. The proximal end of the bag is laid over the abdomen and the shield **900** is inserted into the mouth of the bag and anchored with the retraction finger **904**. A grasper is inserted into the central opening **906** and the specimen inside the bag is pulled towards the central opening **906**. A blade is then used to reduce the specimen for removal in whole or in parts through the small incision/orifice. The shield **900** is made of firm plastic of a sufficient thickness to prevent and reduce that potential for penetration by the blade and protect the adjoining tissue and maintain the integrity of the containment bag.

In another variation, the shield **900** is employed with a retractor of the like described above. The retractor is placed inside the incision either before or after the bag is placed and then the shield **900** is inserted into the mouth of the bag and retractor. In one variation, the proximal end of the shield **900** is sized and configured to mate with the proximal ring of the retractor or bag by capping or snapping with the proximal ring of the bag or retractor. A variation of the shield **900** that is adapted to cap onto the proximal ring of a retractor or bag is shown in FIGS. **1098** and **109**C having an oval-shaped central lumen **906** and a circular-shaped central lumen **906**, respectively. The shield **900** in FIGS. **1098** and **109**C have at least one hook **905** or clamp configured for attaching to the retractor or bag ring.

With particular reference now to FIG. **109**, the funnel **902** includes a circumferential rim **908** that is raised from the inner surface. The rim **908** is configured to connect with a blade and will be described in greater detail below. Also, the funnel **902** includes a raised portion **910**. The raised portion **910** is configured to retain a second shield **912**. A second shield **912** is shown in FIG. **110**. The second shield **912** is similar to the shield described with respect to FIGS. **71-86** as well as to other shields described herein. In one variation, the second shield **912** is spiral in shape and collapsible and expandable in the vertical direction as described above. In the variation shown in FIG. **110**, the second shield **912** is not spiral-shaped but substantially cylindrical having a concave outer surface and a gap **914** to create a C-shaped shield. The second shield **912** includes a proximal flange **916** and a distal flange **918** interconnected by a central portion **920**. The proximal flange **916** may include a tab or finger pull to aid its removal from the orifice/incision. The second shield **912** has a reduced configuration in which a lateral dimension is smaller than a normal relaxed configuration shown in FIG. **110**. The reduced configuration is optimal for insertion into a wound or orifice and for connecting the second shield **912** to the first shield **900**. The second shield **912** is made of flexible plastic having properties sufficient prevent penetration by a blade or other sharp object or instrument under normal use to protect adjacent tissue.

Turning now to FIG. **111**, there is shown the first shield **900** connected to the second shield **912**. The C-shaped second shield **912** is placed inside the first shield **900** such that the proximal flange **916** of the second shield **912** overlays at least a portion of the inner surface of the funnel **902** of the first shield **900**. The raised portion **910** of the shield **900** is received within the gap **914** of the second shield **912**. The connection with the raised portion **910** prevents the second shield **912** from moving around inside the funnel **902**. The first shield **900** provides protection along part of the lower circumference in the location of the retraction finger **904** and the second shield **912** completes the circumferential protection at the distal end. The second shield **912** provides 360 degree circumferential protection at the distal end which is placed in the incision/orifice. Also, the distal flange **918** provides a funnel-like entry into the central lumen **922** of the second shield **912** which helps to move tissue into shields **900**, **912** and out of the body while providing protection for the surrounding tissue, containment bag and retractor if employed. The shields **900**, **912** may be employed with manual bladed morcellation or with a short power morcellator of the like described above with respect to FIGS. **87-90**.

Turning now to FIGS. **112-113**, there is shown a blade carrier **926** connected to the first shield **900** that is in turn connected to a second shield **912** to comprise another variation of the shield system. The blade carrier **926** includes a funnel **928** defining a central opening **930**, a blade receiver **932** and a blade **934**. The funnel **928** includes a funnel-like shape and a circumferential hook configured to cap, snap on and connect to the first shield **900**. In particular, as shown in FIG. **113**, the circumferential hook of the funnel **928** connects directly with the raised circumferential rim **908**. In one variation, the blade carrier **926** snaps with the first shield **900** such that it is vertically retained yet permitted to rotate relative to the first shield **900**. The blade receiver **932** contains the blade **934** within a blade channel **936**. The blade **934** is connected to a blade handle **938** via a pin **940** that connects the blade **934** to an inner rod **942**. Details of the blade housing **932** are also shown in FIGS. **114-115**. In one variation, the inner rod **942** to which the blade **934** is pinned via the pin **940** reciprocates with respect to the blade handle **938**. The reciprocating action may be provided manually by moving the inner rod **942** at the proximal end back-and-forth with respect to the blade handle **938** to effect back-and-forth movement of the blade **934** at the distal end. The reciprocating action may be provided by an electric motor (not shown) located in blade handle **938** at the proximal end in a removable and reusable handle attachment. The blade receiver **932** may be provided in two parts, a first part and a second part. The first part includes a blade channel **936** having a slot **944** configured to receive the pin **940** and configured to guide the translation of the blade **934** inside the blade channel **936**. One end of the pin **940** is connected to the blade **934** and the other end of the pin **940** is connected to the distal end of the inner rod **942** which is housed in the second part of the blade receiver **932** which together house the blade **934**. The blade receiver **932** is connected to the funnel **928** of the blade carrier **926**. The inner rod **942** is moved distally to expose the blade **934** for cutting tissue when in an exposed position. With the blade **934** exposed, the blade carrier **926** may be rotated relative to the first shield **900** to cut tissue circumferentially along at least a part of the interior of the central lumen. The blade **934** can be retracted into a retracted position in which the blade **934** is at least partially concealed inside the blade receiver **932**. When in the retracted position, the sharp sides of the blade **934** are substantially concealed making the blade carrier **926** safe to handle. The blade **934** can be moved from the retracted position to the exposed position manually or automatically to cut tissue. This reciprocal cutting motion can be selectively engaged by the user manually or automatically when tissue cutting is desired or engaged to reciprocate in a continuous manner. Also, the reciprocal cutting action can be performed simultaneously with rotation of the blade carrier **926** with respect to the first shield **900** or performed intermittently with the rotation of the blade carrier **926**. Moving the blade **934** from a retracted position to an exposed position moves the blade **934** into a plane containing the distal end of the central opening **930** at an angle with respect to the plane or substantially perpendicular to the plane. This plane may also be defined as the plane perpendicular to the longitudinal axis of the device or longitudinal axis of the central lumen. The amount that the blade **934** is exposed may be selected by the user to effect selective cutting. For example, the blade **934** may be exposed halfway from a completely retracted position in which case, the blade **934** may not cross the plane containing the distal end of the central opening **930**. The blade **934** is configured to extend beyond the distal end of the central opening **930** of the blade carrier **926** but not beyond the distal end of the second shield **912**, thereby, ensuring that the blade **934** and the blade pathway is always encompassed and surrounded by either one or more of the first shield **900**, second shield **912**, and blade carrier **926**. In another variation, the distal end of the blade **934** is permitted to extend slightly beyond the distal end of the second shield **912**.

In one variation, the blade **934** is fixed with respect to the blade receiver **932** and does not reciprocate with respect to the blade carrier **926** and only rotates with respect to the first shield **900**. In another variation, the blade carrier **926** is fixed with respect to the first shield **900** in the sense that it does not rotate with respect to the first shield **900** but is configured such that the blade **934** reciprocates with respect to the blade carrier **926**. The rotational cutting action aims to increase the chances that the specimen will be removed as a single extraction instead of multiple pieces while ensuring protection to the surrounding tissue. Also, the blade **934** is illustrated in the figures to curve downwardly into central opening. In other variations, the blade **934** extends radially inwardly in a plane perpendicular to the central lumen and has a configuration similar to a guillotine or cigar-cutter. It is within the scope of the present invention for the blade **934** to have an approach angle of zero to less than 180 degrees wherein a zero approach angle would be the blade **934** crossing the plane perpendicular to the longitudinal axis of the central lumen parallel to the longitudinal axis at a twelve o'clock position. An approach angle of less than 180 degrees would be the blade **934** crossing the plane that is perpendicular to the longitudinal axis from beneath the plane at approximately 5 and 7 o'clock positions.

FIG. **116** illustrates the blade **934** of the blade carrier **926**. The blade **934** has a sharp tip and sharp sides configured to pierce tissue as well as to cut tissue.

Turning now to FIGS. **117-119**, there is shown the shield assembly **950** including the blade carrier **926**, first shield **900**, and second shield **912**. The blade **934** is shown connected to a blade handle **938** having motor housed inside a detachable handle extension **946**. The first shield **900** includes a cutout **948** visible in FIGS. **109**, **111**, **117** and **118**. The cutout **948** facilitates separation and removal of the blade carrier **926** from the first shield **900** by providing a location for a finger to snap the blade carrier **926** away from the first shield **900**.

Turning now to FIGS. **120-126**, there is shown another variation of the shield assembly. The shield assembly includes a first shield **900**, a second shield **912** and a blade carrier **926**. The blade carrier **926** comprises a blade receiver in two parts **932***a*, **932***b*, a blade **934**, an inner rod **942**, a pin **940**, and a blade handle **938**. The length of the blade handle **938** is not shown to scale and is drawn for illustrative purposes to include a variation where a reusable handle extension **946** can be attached to the proximal end of the blade handle **938** in a construct in which the shield assembly is disposable. The variation of FIGS. **120-126** is substantially similar to the variation shown in FIGS. **109-119** with several modifications. The second shield **912** is of a spiral nature described above instead of a cut cylinder. The second shield **912** is shown in a compressed configuration in FIG. **120**. The first shield **900** includes an outer rim **908** located at the top periphery of the first shield **900**. The funnel **928** of the blade carrier **926** snaps under the outer rim **908** in the variation shown in FIGS. **120-126**.

In another variation of the shield, the shield is molded about a helicoid whose cross-section normal to the helical guide path is parabolic. Once taken off the mold, the helicoid is compressed upon itself into the shape of a catenoid in which it will stay during its resting state. The parametric equations below cover variations of the shield.

$$x(u,v)=\beta[\cos(\alpha)\sin h(v)\sin(u)+\sin(\alpha)\cos h(v)\cos(u)] \quad (1)$$

$$y(u,v)=\gamma[-\cos(\alpha)\sin h(v)\cos(u)+\sin(\alpha)\cos h(v)\sin(u)] \quad (2)$$

$$z(u,v)=\delta[u\cos(\alpha)+v\sin(\alpha)] \quad (3)$$

The value a is a constant, fixed parameter that changes the state of progression in the deformation of a helicoid into a catenoid. For $\alpha=0$, a helicoid is generated; for $\alpha=\pi/2$ a catenoid is generated. Variations of the shield have a value of α that is greater than 0 and less than $\pi/2$ which can be considered on the open interval of $(0, \pi/2)$. Other variations of the shield have a value of a that is greater than 0 and less than or equal to $\pi/2$ which can be considered on the open interval of $(0, \pi/2)$. Other variations of the shield have a value of a that is equal to or greater than 0 and less than or equal to $\pi/2$ which can be considered on the open interval of $(0, \pi/2)$. The parameters β, γ, δ are also fixed constants. For $\beta, \gamma, \delta \in R \setminus \{0\}$, for $\beta<0$, $\gamma<0$, $\delta<0$ the rotation will flow counterclockwise. If for any $\beta, \gamma, \delta>0$ the rotation will flow clockwise. By means of the parametric equations, the surface is constructed on the u-v plane. Values for vectors u and v can be considered for $u \in (-\pi,+\pi)$ and $v \in (-\infty,+\infty)$.

Turning now to FIG. **127**, there is shown another variation of a containment bag **1000** according to the present invention. The bag **1000** includes a sidewall **1002** that defines an opening **1004** at the proximal end. The bag **1000** has a longitudinal axis that is substantially perpendicular to the opening **1004**. The sidewall **1002** may form any shape for the bag **1000** such as cylindrical, elongate, spherical and the like and may or may not include a base or bottom panel from which the sidewall **1002** extends towards the proximal end. The sidewall **1002** may extend downwardly to define the base with or without a seam. For example, the bag **1000** may be formed by a planar length of material that is folded and joined along the sides such that the seams are not formed along the base, but instead, are located at the sides of the bag **1000** and extend upwardly substantially perpendicular to the longitudinal axis.

Still referencing FIG. **127**, the containment bag **1000** includes at least a first ring **1006** located at or near the opening **1004** of the bag **1000**. The first ring **1006** is connected to the bag **1000**. A second ring **1008** is shown in FIG. **127**. The second ring **1008** is located a distance below the first ring **1006** and is connected to the bag **1000**. The first ring **1006** and second rings **1008** are resilient and compressible from an expanded configuration that is circular or oval in shape into a collapsed elongate configuration having a reduced lateral dimension suitable for passing into a small incision, body orifice or through the lumen of a trocar. In one variation, the second ring **2008** is not employed. The bag **1000** is collapsible along the longitudinal axis of the bag **1000** to a shorter length. The collapsed bag **1000** is then subsequently easily compressed in a lateral direction by squeezing the first ring **1006** and the second ring **1008**, if a second ring **1008** is employed, into their collapsed elongate configurations and deployed into the abdominal cavity. Inside the abdominal cavity, the compressed rings **1006**, **1008** are allowed to return to their original expanded open configurations. With the rings **1006**, **1008** in their expanded configurations inside the abdominal cavity, the bag **1000** is easily oriented within the abdominal cavity. The location within the perimeter of the rings **1006**, **1008** provides a target for the placement of an excised tissue or organ. In one variation, the bag **1000** in a collapsed configuration does not have a right side up because either side can be used to place the specimen within the boundaries of the first/second rings **1006**, **1008**. The first ring **1006** serves as a perimeter guide for specimen placement within the perimeter of the first ring **1006** and, hence, the first ring **1006** may be brightly colored or contrast colored with the rest of the bag **1000** or its intended surroundings so that it can be easily observed with a laparoscope. After the excised tissue or organ is placed inside the perimeter of the first ring **1006**, the first ring **1006** is moved towards the exit incision or orifice. The lifting of the ring **1006** results in the excised tissue moving or falling deeper into the bag's interior space **1010**. Movement of the bag towards the exit opening results in the tissue specimen becoming seated within interior space **1010** of the bag **1000**. The first ring **1006** is compressed into the reduced elongate configuration and pulled through the exit orifice, opening or exit incision. Once passed the opening, the first ring **1006** is allowed to self-expand and spring back to an open enlarged configuration residing above the abdominal wall or outside the patient near and overlaying the exit orifice, opening or exit incision. The first ring **1006** is rolled or flipped over itself by inverting the first ring **1006** outwardly or inwardly to roll the bag **1000** onto the first ring **1006**. The first ring **1006** can be rolled in the opposite direction to unfurl the bag **1000** from the first ring **1006**. In one variation, the first ring **1006** has a cross-section that has a length greater than its width. The elongate cross-section of the first ring **1006** advantageously keeps the bag sidewall **1002** rolled-up onto the first ring **1006**. If the cross-section of the first ring **1006** is circular, the first ring **1006** may more easily roll and un-roll to roll or un-roll the sidewall **1002** with respect to the first ring **1006**. The rolling of the first ring **1006** about itself draws the bag **1000** upwardly and brings the specimen inside the bag **1000** closer to the opening. With the rolling of the first ring **1006** the distance of sidewall **1002** between the first ring **1006** and the second ring **1008** is reduced which brings the second ring **1008** into closer proximity to the first ring **1006** resulting in the abdominal wall being anchored between the first ring **1006** and the second ring **1008** securing the bag **1000** to the patient for the ensuing morcellation. The rolling action of the bag **1000** reduces the volume of the bag **1000** and also creates a nicely-formed and taut protective apron at the opening as well as outside the patient surrounding the opening. The rolling action may also serve to retract the tissue at the opening conveniently enlarging the opening for easy tissue extraction from inside the bag **1000**. The tissue specimen is then pulled from the bag **1000** by morcellating it manually with a blade or automatically with an electronic morcellator into a size and shape that can be passed through the opening and removed from the bag **1000**. After the tissue specimen is extracted from the bag **1000**, the first ring **1006** is unrolled loosening the space between the two rings **1006**, **1008** if it is necessary to do so. Then, the second ring **1008** is compressed into its reduced elongate configuration and pulled outside of the patient through the opening and the bag **1000** is removed from patient.

The bag **1000** and/or the sidewall **1002** of the bag **1000** is made of a material that is extremely cut-resistant to sharp objects such as scalpel blades and blades used in electronic morcellators. In one variation, the bag **1000** is made of an extremely cut-resistant woven material like DYNEEMA® fiber. The cut-resistant material is an ultra-high-molecular-weight polyethylene (UHMWPE) also known as high-modulus polyethylene or high-performance polyethylene. In one variation, the bag **1000** is made of DYNEEMA® coated with an elastomer to prevent fluids from traversing the material plane. In one variation, the entire bag **1000** is made of the cut-resistant material. In another variation, only select portions of the bag **1000** are made of the cut-resistant material. In one variation, at least a portion the sidewall **1002** of the bag **1000** that is located between the first ring **1006** and the second ring **1008** is made of the cut-resistant material. In another variation, only part of the bag **1000** is made of the cut-resistant material in areas where cutting is expected. In another variation, the bottom portion of the distance between the two rings **1006**, **1008** is made of the cut-resistant material, leaving the top portion of the distance between the two rings **1006**, **1008** available for rolling onto the first ring **1006**. In another variation, the top portion of the distance between the two rings **1006** is made of the same cut-resistant material but has a thickness or fiber thickness that is smaller than the thickness of the sidewall or fiber thickness of the bottom portion. In variations, where part of the bag **1000** is made of cut-resistant material, the other remaining portions are made of suitable polymer material described above. In one variation, use of the bag **1000** made of cut-resistant material eliminates the need for a retractor described above to be used in conjunction with the bag **1000** in a morcellating procedure. Hence, the bag **1000** advantageously not only provides cut resistance and safety shielding during morcellation but also serves to retract the opening in which it is inserted. Because the bag **1000** is cut-resistant, it may be employed without a shield/guard of the types described above. The absence of a shield or guard may advantageously provide for a larger working space.

Embodiments of the bag **1000** comprise sheets, membranes, fibers, and/or strands of one or more materials that endow the sheath with abrasion and puncture resistance in addition to cut resistance. Suitable sheets, membranes, fibers, and/or strands comprise at least one of natural polymers, semi-synthetic polymers, synthetic polymers, metal, ceramic, glass, carbon fiber, carbon nanotubes, and the like. Suitable natural polymers include cellulose, silk, and the like. Semi-synthetic fibers include nitrocellulose, cellulose acetate, rayon, and the like. Suitable synthetic fibers include polyester, aromatic polyester, polyamide (NYLON®, DACRON®), aramid (KEVLAR®), polyimide, polyolefin, polyethylene (SPECTRA®), polyurethane, polyurea, polyvinyl chloride (PVC), polyvinylidene chloride, polyether amide (PEBAX®), polyether urethane (PELLETHANE®), polyacrylate, polyacrylonitrile, acrylic, polyphenylene sulfide (PPS), polylactic acid (PLA), poly(diimidazopyridinylene-dihydroxyphenylene) (M-5); poly(p-phenylene-2, 6-benzobisoxazole) (ZYLON®), liquid crystal polymer fiber (VECTRAN®), and the like, and blends, copolymers, composites, and mixtures thereof. Suitable metals include stainless steel, spring steel, nitinol, super elastic materials, amorphous metal alloys, and the like. The bag **1000** includes retractor integration providing both specimen containment and tissue retraction features. Additional retraction features and materials and construction that are incorporated into the bag **1000** in variations of the present invention are described in U.S. Patent Application Publication 2011/0054260A1 which is incorporated herein by reference in its entirety.

Currently available morcellators generally cut tissue with an exposed, unprotected device such as a sharp blade or energy tip in the body cavity. For most morcellators this causes added danger because the exposed blade/tip could easily contact unintended areas causing damage to organs, tissue, vessels, etc. Since current morcellators sever tissue in open areas, it's possible for smaller pieces of cut tissue to be left behind after the tissue removal procedure. These pieces can lead to endometriosis in females where uterus cells attach themselves to other organs or tissue walls. The pieces can also contain cancer cells which must be completely removed. Currently, if tissue is expected to be cancerous then the entire mass is removed openly instead of laparoscopically which increases the risk of infection for the patient, as well as increased recovery time. Even if all the pieces are found, there is still an increase in surgery time due to the extra step of searching the body cavity for the smaller members of tissue. Furthermore, current morcellators require two people to perform the procedure. One person pulls the tissue through the morcellator with a tenaculum while another person has to hold the remaining tissue mass close to the tip of the rotating blade from inside the body cavity. As the procedure is performed the specimen is usually dropped or tears away from the instrument holding it in place during morcellation. This causes added time as the person in charge of positioning the specimen in front of the morcellator has to find the tissue and re-clamp their instrument to it before placing the specimen in front of the morcellator again. Hence, morcellation in containment such as a bag is desirable; however, the bag itself is subject to potential puncture and spilling of contents. The specimen bag of one variation of present invention has a protective inner layer of material to resist punctures from the tenaculum jaws and rotating morcellator blade. Also, since the morcellator is locked into a stationary position with the use of any of the aforementioned stabilizers, the likelihood of the blade contacting the bag is greatly reduced. With a specimen bag, the entire tissue sample will be contained so even if small pieces fall off from the larger specimen during morcellation they will be removed when the bag is pulled out of the patient. This increases patient safety and reduces surgery time for the morcellation procedure since there is no need to search for left behind tissue pieces. The specimen bag will support the tissue and keep it in place. This allows one person to perform the morcellation procedure instead of two. It also reduces time required to continually relocate and re-clamp the specimen.

With reference now to FIGS. **128**-**134**, the tissue morcellator **3000** is a multi-component medical device used to capture tissue specimens such as a uterus inside the human body under laparoscopic surgical conditions and reduce it in size for removal though small incisions, orifices, openings that may or may not include laparoscopic ports. The morcellator **3000** includes a gear housing **3016** containing a gear train, as can be seen clearly in FIG. **133**, connected to a flexible transmission shaft **3018** connected at the proximal end to a motor to turn the morcellator blade **3010**. The morcellator **3000** has a central working channel lumen **3020** that extends through the length of the morcellator **3000**. The inner and outer tubes of the morcellator **3000** are stationary and non-rotating relative to the moving blade **3010** to provide no moving surfaces against the tissue as it is being removed through the lumen **3020**. In one variation, the morcellator **3000** includes a camera **3022**. The camera **3022** may be integrally formed with the rest of the morcellator **3000** or comprise a separate add-on that slides over the morcellator shaft and connects to the morcellator **3000** as shown in FIG. **134**. As also seen in FIG. **132** the distal end of the morcellator shaft includes a fixed protruding appendage that covers at least part of the blade extending distally to interrupt the morcellation of tissue to prevent tissue from rotating relative to the instrument.

Still referencing FIGS. **128**-**134**, the morcellation system further includes a tenaculum **3012** having an elongated shaft **3028**, a jaw-like grasper at the distal end controlled at a handle **3024** at the proximal end to open and close the jaws **3026** to grasp tissue. The shaft **3028** and jaws are configured to fit inside the working channel **3020** of the morcellator

3000 and extend and protrude out the distal end of the morcellator shaft. The tenaculum handle **3024** is designed to be held vertically in either the left or right hand and the ergonomic design is meant to optimize the movement of the hand and arm pulling upwards. The handle **3024** includes a lever **3030** that is squeezed toward the handle **3024** to close the jaws **3026** as shown in FIG. **129**. Alternatively, the lever **3030** may be squeezed to open the jaws **3026**. The lever **3030** is under spring tension so that the lever **3030** springs open away from the handle **3024** which may define the closed configuration of the jaws **3026** allowing the user to then focus on pulling the tenaculum **3012** upwardly to extract tissue. Alternatively, the trigger is under spring tension so that the lever **3030** will spring away from the handle **3024** to open the jaws **3026**.

With particular reference now to FIGS. **130-132**, the tenaculum jaws **3026** include a distal tip **3032** that is curved. The jaws **3026** include an upper jaw and a lower jaw hinged together. Each of the upper and lower jaw includes a rounded and curved distal end that does not have any sharps along a curve that is traced by the distal end **3032** in the opening and closing of the jaws **3026**. In a closed configuration shown in FIGS. **130-131**, the curved distal tip **3032** presents no exposed sharp points or edges that may pose a danger to tissue or bag integrity when in an open or closed configuration. The inside of the upper and lower jaws includes teeth **3034**. Also, the distal tip **3032** includes interlocking teeth **3034** from the upper and lower jaw that providing a positive purchase on grasped tissue while providing a smooth curved outer surface to protect any surrounding tissue and/or bag. FIG. **132** illustrates the jaws **3026** in an open configuration showing the pathway **3036** followed by the distal end **3032** in the opening and closing of the tenaculum. The curved distal end **3032** advantageously protects the bag in which morcellation is taking place from being punctured as tissue is grasped. Even when the jaws **3026** are fully opened the curved distal end **3032** of the jaws are capable of protecting the bag from unwanted punctures.

Turning now to FIGS. **135**A-**135**D and FIGS. **136**A-**136**B, the morcellation system includes a specimen retrieval receptacle bag **3002**. The morcellation system described may be adapted for use with a power morcellator as described above or can also be employed with manual morcellation. The bag **3002** is shown flat in FIG. **135**A and rolled up in FIGS. **135**B and **135**C. The bag **3002** includes a bag ring **3004** that encompasses the opening or mouth of the bag **3004**. FIG. **136**A illustrates a tissue specimen **3006** captured inside the bag **3002** with the bag ring **3004** being pulled to the outer surface. FIG. **1368** illustrates the bag ring **3004** pulled completely through the body opening to expose the interior of the bag **3002** to the exterior of the body for removal of the specimen **3006** inside the bag **3002**. In FIG. **1368**, a tissue guard **200** is shown ready for insertion into the body opening. Although, the tissue guard **200** is shown any tissue guard according to the present invention may be employed.

With reference to FIGS. **137**A-**137**C and FIGS. **138**A-**138**C, another variation of the bag **3002** is shown. The bag **3002** includes a bag ring **3004** having an elongated cross-section such as the cross-section shown in FIG. **137**C. The bag **3002** of FIGS. **137**A-**137**C is configured to be rolled down to wrap the sidewall of the bag **3002** around the bag ring **3004**. FIG. **138**A illustrates a bag **3002** with a specimen of tissue **3006** inside its interior. The bag ring **3004** is being pulled through the body opening to the surface of the body. FIG. **1388** illustrates the bag ring **3004** completely pulled to the surface and FIG. **138**C illustrates the bag ring **3004** being rolled or flipped about itself as shown by the arrows in FIG. **138**C and as previously described in this specification to reduce the length of the sidewall of the bag and bring the contents of the bag closer to the surface where it can be more easily morcellated. The bag ring **3004** is not limited to having the cross-section of FIG. **137**C and any cross-section that permits the bag to be rolled about the bag ring is within the scope of the present invention. The bag ring **3004** is both flexible so as to be capable of being squeezed and compressed into an elongate shape so that it can be inserted and removed through a small incision or body opening. The resilient bag ring **3004** expands when released to assume its open mouth configuration enabling easy placement of specimen **3006** into the interior of the bag **3002**. The bag **3002** has an open top with a semi-rigid bag ring **3004** attached at the top at or near the mouth of the bag **3002**. The bag **3002** can be deployed into the body such as into the abdomen via a trocar or other deployment instrument. The bag **3002** can be manipulated with graspers. The specimen **3006** is loaded into the bag **3002** and the bag **3002** is retrieved through the body wall **3056** such as the abdominal wall. The entire bag **3002** does not pass through the small laparoscopic incision due to the large size of the specimen **3006**. The semi-rigid bag ring **3004** is the only portion that is allowed to surface with the rest of the bag remaining inside the abdominal body cavity. The cross-section of the semi-rigid ring allows for the bag **3002** to be shortened by a rolling method. This not only shortens the bag **3002** but helps in wound retraction. The tissue **3004** sample acts as an anchor to allow retraction of the wound opening allowing greater access to the tissue **3006** with power or manual morcellation instrument(s). Once the bag **3002** is in place, morcellation can begin. As the tissue sample **3006** decreases in size the semi-rigid bag ring **3004** can be rolled more to bring the tissue **3006** closer to the surface and allow easier access for morcellation. Once enough of the tissue **3006** is removed, the bag **3002** can then be withdrawn from the patient. FIG. **138**C, illustrates a tissue guard **200** ready to be inserted into the body opening and into the bag **3002**.

With reference to FIGS. **139**A-**139**C, the bag **3002** is connected to a delivery shaft **3038** configured to open and close the mouth of the bag **3002**. The delivery shaft **3038** is used to conveniently scoop the specimen **3006** when in an open mouth configuration. The delivery shaft **3038** is manipulated to close the mouth of the bag **3002** after the specimen **3006** has been captured to bring the bag ring **3004** through the opening in the body and to the surface for morcellation and removal of the specimen **3006**. The bag **3002** has an open top with a semi-rigid bag ring **3004** attached at the top. The bag **3002** is attached to a two fork shaft **3038**. The forks are made of a semi-rigid material such as spring steel. The purpose of the delivery shaft **3038** is to allow the bag to be manipulated with greater accuracy and ease. The system can be deployed into the abdomen via a trocar cannula **3044**. The specimen **3006** is loaded into the bag **3002** and the bag **3002** is retrieved through the abdominal body wall **3056**. To retrieve the bag **3002** the forked shaft **3038** is pulled through the trocar cannula **3044** until the corner of the bag **3002** is leading into the distal tip of the trocar cannula **3044**. Once the bag **3002** has engaged the trocar cannula **3044**, the bag **3002** can be drawn up to the surface through the wound opening. The entire bag **3002** does not pass through. The semi-rigid bag ring **3004** is the only portion that is allowed to the surface. Once at the surface the forked deliver shaft **2038** can be removed from the semi-rigid bag ring **3004**. The cross-section of the semi-rigid bag ring **3004** allows for the bag **3002** to be shortened by a rolling method. This not only shortens the bag **3002** but helps in wound retraction. The tissue sample **3006** acts as an anchor to allow retraction of the wound opening allowing greater access to the tissue **3006** with morcellation instruments. Once the bag **3002** is in place, morcellation can begin. As the tissue sample **3006** decreases in size the semi-rigid bag ring **3004** can be rolled more to bring the tissue **3006** closer to the surface and allow easier access for the morcellation instruments and blades. Once enough of the tissue **3006** is removed the bag **3002** can then be withdrawn from the patient. In an alternative arrangement, the bag **3002** is provided with a second bag ring **3040**. The second bag ring **3040** is attached to the bag **3002** approximately mid distance down the bag **3002**. This second bag ring **3040** serves as an anchor to allow the bag **3002** to be shortened while simultaneously retracting the wound to its largest potential opening. The bag **3002** is attached to a two fork delivery shaft **3038**. The forks are semi-rigid. With the first bag ring **3004** residing outside the patient, the first bag ring **3004** is rolled/flipped about itself. The cross-section of the semi-rigid first bag ring **3004** allows for the bag **3002** to be shortened by a rolling method. This not only shortens the bag **3002** but helps in wound retraction. The second bag ring **3040** that is midway down the bag **3002**, acts as an anchor to allow maximum retraction of the wound opening. This allows greater access to the tissue **3006** with the various morcellation instruments. Once the bag **3002** is in place, morcellation can begin. Once enough of the tissue **3006** is removed the bag **3002** can then be withdrawn from the patient.

Turning now to FIGS. **140**A-**140**B and **141**A-**141**D, there is shown another variation of the bag **3002** according to the present invention. The bag **3002** includes a sidewall defining an interior and a mouth. A first bag ring **3004** and a second bag ring **3040** are provided. The second bag ring **3040** is spaced distally apart from the first bag **3004** and interconnected by the sidewall. The bag **3002** includes a balloon **3042** located at the bottom of the bag **3002**. The balloon **3042** forms at least part of the base of the bag and has a deflated condition and an inflated condition. The interior of the balloon **3042** is interconnected to a source of inflation pressure providing positive pressure into the balloon **3042**. The source of inflation pressure may also provide a negative pressure to remove inflation fluid to deflate the balloon **3042** as desired by the user. The source of inflation pressure is actuated by the user manually or automatically. The balloon **3042** at the base of the bag **3002** is spaced distally from the second bag ring **3040** as shown in FIG. **140**A. FIG. **141**A illustrates the bag **3002** inserted into the body through a body wall **3056** with the first bag ring **3004** pulled to reside outside the body to provide access to the interior of the bag **3002** such that the specimen **3006** located therein may be extracted from the bag **3002**. FIG. **141**B illustrates the proximal end and mouth of the bag **3002** being pulled until the second bag ring **3040** substantially engages the undersurface of the body wall **3056**. FIG. **141**C illustrates the first bag ring **3004** being rolled about itself to wrap the sidewall of the bag **3002** around the first bag ring **3004**. As the first bag ring **3004** is being rolled, the length of the sidewall located between the first bag ring **3004** and the second bag ring **3040** is reduced. Such reduction in the length of the sidewall brings the base of the bag **3002** and the specimen located inside the bag **3002** closer to the surface opening in the body. FIG. **141**D shows the balloon **3042** in the inflated condition which further raises the specimen **3006** closer to the opening for ease of visualization, morcellation and removal. The balloon **3042** advantageously provides an added protective interface or barrier between the interior and the exterior of the bag **3002**. For example, if a morcellation instrument such as a scalpel, power morcellator or grasper accidentally breaches the proximal end of the balloon **3042** that is facing the interior of the bag **3002**, the balloon **3042** may deflate but the overall integrity of the bag **3002** is not breached as a containment barrier to the exterior or sidewall of the bag remains intact. In essence, the balloon **3042** provides a double-wall that provides added protection in a location of the base which is likely to encounter sharp instruments in the course of morcellation. The inflatable base of the bag **3002** also provides a pedestal effect for the tissue specimen **3006** even if the tissue **3006** is not centrally located atop the balloon **3042**. Also, the inflatable base of the bag **3002** when in the inflated condition provides a moat-like location for bodily fluid such as blood to drain away from the specimen **3006**. When inflated, the balloon **3042** interior wall is spaced significantly further apart from the exterior wall in the double-wall arrangement of the base, thereby, keeping the exterior wall safely away from impinging instruments and more likely to remain intact in the case of a breach in the interior wall. The double-wall sidewall may be employed throughout the bag **3002** and not just in the location of the base. Breach and the resulting subsequent deflation of the balloon **3042** provides visual notice to the user that a sharp instrument has impinged the balloon and alerts the user to employ extra care to ensure safety of the exterior wall when continuing with the extraction. This is in contrast to a single-walled configuration in which a breach of the sidewall means a breach to the exterior of the bag **3002** without warning. After the specimen **3006** is raised to the surface, the specimen **3006** can be easily visualized from outside the body through the mouth of the bag **3002** and morcellation can proceed more easily. The balloon **3042** can be any inflatable member and can be integrated into the floor of the bag **3004**. As morcellation is carried out, the tissue is reduced in size. This can result in the specimen becoming lost in the bag **3002** and harder to find with the morcellator and instruments. By inflating the balloon **3042**, the tissue **3006** is raised up closer to the end of the morcellator and instruments allowing greater ease of access to the tissue sample **3006**.

Turning now to FIGS. **142**A-**142**C and **143**A-**143**D, there is shown another variation of a containment bag **3002** having an inflatable sidewall. The bag **3002** has a sidewall formed to have an open top serving as a mouth or entryway into the interior of the bag **3002**. The bag **3002** includes a first semi-rigid bag ring **3004** attached at the top near the opening. There is also a second bag ring **3040** that is attached approximately mid distance down the bag **3002**. The second bag ring **3040** serves as an anchor to allow the bag **3002** to be shortened and retract the wound to its largest potential opening. The bag **3002** utilizes air channels **3008** to aid in expanding the lower portion of the bag **3002** that contains the specimen. By expanding the lower portion the visibility of the specimen from the top side is greatly increased. It also aids in the speed at which morcellation can be carried out. The bag **3002** is attached to a two fork delivery shaft **3028**. The forks are semi-rigid. The purpose of the delivery shaft **3028** is to allow the bag **3002** to be manipulated with greater accuracy and ease. The system can be deployed across a body wall **3056** into the abdomen or other location or orifice of the body. The tissue specimen **3006** is loaded into the bag **3002** and the bag **3002** is retrieved through the abdomen body wall. To retrieve the bag **3002** the forked shaft **3028** is pulled through the trocar until the corner of the bag **3002** is leading into the trocar. Once the bag **3002** has engaged the trocar, the bag can be drawn up to the surface as shown in FIG. **143**A. Once at the surface, the forked shaft can be removed from the first semi-rigid bag ring **3004**. The entire bag **3002** does not pass through. The semi-rigid first ring **3004** and part of the sidewall is allowed to surface. The cross section of the semi-rigid first ring **3004** allows for the bag **3002** to be shortened by a rolling method illustrated by the arrows in FIG. **143**C. This not only shortens the bag **3002** but helps in wound retraction as shown in FIG. **143**C. The second bag ring **3040** that is midway down the bag **3002**, acts as an anchor to allow maximum retraction of the wound opening. This allows greater access to the tissue **3006** with the morcellator. The bag **3002** serves both containment and retraction functions. Once the wound has been retracted, the air channels **3008** can be inflated as shown in FIG. **143**D and an optional tissue guard **200** may be employed. The air channels **3008** will expand outward creating free space around the tissue **3006**. This allows the tissue **3006** to be in more of a free space. By being in more of a free space, the tissue **3006** can tumble and move as it is being morcellated. Once the bag is in place, morcellation can begin. Once enough of the tissue **3006** is removed, the bag **3002** can then be withdrawn from the patient. In an alternative variation, the base of the bag **3002** may be also inflatable such as described with respect to FIGS. **140**-**141**.

Turning now to FIGS. **144**A-**144**C and **145**A-**145**D, there is shown another variation of a containment bag **3002** having an inflatable sidewall without a second bag ring **3040** and only a first bag ring **3004**. The bag **3002** has an open top with a semi-rigid first bag ring **3004** attached at the top. The bag **3002** utilizes air channels **3008** to aid in expanding the lower portion of the bag **3002** that contains the specimen **3006**. The air channels **3008** are circumferentially located around the bag perimeter at the lower portion of the bag. The air channels **3006** are interconnected and connectable to a source of inflation pressure. Positive inflation pressure inflates the channels and negative pressure acts to actively deflate the channels **3008**. A deflated configuration is shown in FIG. **145**A and an inflated configuration is shown in FIG. **145**B-**145**D. In one variation, the air channel closest to the opening of the bag which is the proximal-most air-channel, is annular and is larger than the other air channels. The air channels **3008** are tubular ring-shaped lumens that may be fluidly connected with one or more adjacent tubular ring-shaped lumens and configured to be connectable to a source of inflation fluid. This proximal-most, first annular ring-shaped air channel lumen provides a reaction force on the underside of the abdominal wall to allow greater retraction as the upper bag ring **3004** is rolled down causing retraction. Therefore, the first annular ring-shaped lumen acts similarly to the second bag ring **3040** of the previous variation. Also, by expanding the lower portion the visibility of the specimen **3006** from the top side is greatly increased. It also aids in the speed at which morcellation can be carried out. The bag **3002** is attached to a two-fork delivery shaft **3038**. The forks are semi-rigid. The purpose of the delivery shaft **3038** is to allow the bag to be manipulated with greater accuracy and ease. The system can be deployed into the abdomen body via a trocar. The specimen **3006** is loaded into the bag **3002** and the bag **3002** is retrieved through the abdomen body wall. To retrieve the bag **3002** the forked shaft is pulled through the trocar until the corner of the bag is leading into the trocar. Once the bag **3002** has engaged the trocar the bag can be drawn up to the surface. The entire bag does not pass through. The semi-rigid bag ring **3004** and a portion of the bag sidewall is the only portion that is allowed to surface as shown in FIGS. **145**A-**145**D. Once at the surface the forked shaft can be removed from the semi-rigid bag ring **3004**. The cross section of the semi-rigid bag ring **3004** allows for the bag **3002** to be shortened by a rolling method shown by the arrows in FIG. **145**D. This rolling action not only shortens the bag **3002** by rolling the sidewall of the bag up but helps in wound retraction. The bag **3002** is then inflated. The bag **3002** may also be inflated prior to rolling as shown in the figures. The first annular air channel **3008** that is approximately midway down the bag and acts as an anchor to allow maximum retraction of the wound opening. This allows greater access to the tissue with the morcellator. The air channels **3008** will expand outward creating free space around the tissue **3006**. This allows the tissue **3006** to be in more of a free space. By being in more of a free space, the tissue **3006** can tumble and move as it is being morcellated. Once the bag **3002** is in place, morcellation can begin. Once enough of the tissue **3006** is removed, the bag **3002** can then be withdrawn from the patient. In an alternative variation, the base of the bag **3002** may be also inflatable such as describe with respect to FIGS. **140**-**141**.

Many different types of materials can be used for the bag and semi-rigid ring. Multiple materials may be desirable on the same bag such as hybrid between polymers and woven textiles. The semi-rigid ring can be made from a multitude of flexible polymer materials including but not limited to pellethane, silicone, KRATON polymer, IROGRAN polyester-based thermoplastic polyurethane, metal, polymer, plastic, rubber, and the like.

Any of the containment bags described in the present invention, including inflatable bags **3002**, can be used with a guard or shield configured for placement within the bag **3002** to protect the bag sidewall and the adjoining tissue margin from sharp manual or power morcellation instruments. Additional examples of guards are shown in FIGS. **146**-**148**. FIGS. **146**A-**146**B, illustrate a cylindrical rigid guard **3047** having a circular-shaped proximal end **3048** and an outwardly flared funnel-like distal end **3050**. The funnel-shaped guard **3047** acts to concentrate or funnel the tissue toward the cutting blade blade. The central lumen of the guard **3047** enlarges in the distal direction. The funnel shape also assists in spreading the sidewall of the bag **3002** away providing clearance for morcellation and prevents the specimen bag from engaging the blade. The guard **3047** may also include a spring loaded guard feature that prevents the blade from being exposed unless the tissue is engaged. This makes for safer handling of the morcellator. The blade guard can be adapted to work with the spring loaded guard.

With reference to FIGS. **148**A-**148**B, the guard **3047** has a reversed funnel at the distal end or lead-in guard wherein the central lumen decreases towards the distal end **3050**. The lead-in guard **3047** allows for easier coring of tissue **3006**. The blade guard **3047** is cone-shaped with the narrow end **3050** pointing in the same direction as the leading edge of the blade of the morcellation tool. The guard **3047** pushes the surrounding tissue away and to the side once the blade is engaged with the tissue **3006**.

Turning now back to FIGS. **147**A-**147**B, there is shown another variation of the guard **3047** that includes anti-rotation studs **3052** that extend from the inner surface of the guard **3047** into the central lumen. The inwardly-projecting anti-rotation studs **3052** keep lumped mass tissue **3006** from catching in the rotating blade and rotating tube and spinning together when a power morcellator is used. If the tissue **3006** is spinning with the blade, then there is no relative blade movement; therefore, it will not cut the tissue. The anti-rotation studs **3052** can also be located on the outside of the guard **3052** extending outwardly from the outer surface of the guard **3047**. These projections would arrest rotation of the guard **3047**. The anti-rotation studs **3052** on the inside also help guide and lead tissue **3006**. The studs **3052** can have various shapes and sizes. This feature can be adapted to work with every guard. In another variation, a bipolar perpendicular tissue separator may be included with the guard. The bipolar perpendicular tissue separator feature functions to sever cores of tissue from the lump mass. This alleviates the problem of coring and not being able to separate the morcellated core from the large mass. This feature can be adapted to work with every blade guard. Also, a light may be included with the guard **3047** and integrally formed with it. The purpose of the light source such as a LED is to enhance and improve visibility inside the tissue bag **3002** for greater scope visibility. This feature can be adapted to work with every blade guard. The variation of FIGS. **147**A-**147**B further includes a plurality of holes **3054** extending across the guard **3047**. These holes **3054** serve as vacuum bypass holes **3054** configured to prevent the bag **3002** from being drawn into the blade when vacuum is employed to draw tissue **3006** out of the bag **3002** such as with a vacuum power morcellator system. This is achieved by always having a radial hole **3054** exposed around the guard **3047**. Once tissue is engaged with the blade the vacuum bypass holes will not affect the vacuum interface with the tissue. This feature can be adapted to work with every blade guard used under vacuum.

Morcellation is performed manually by the surgeon with a scalpel or electrosurgical instrument. Instead of utilizing a power morcellator, any bag variation described herein is employed with manual morcellation. The bag is inserted into the body cavity through an incision. Target tissue is placed into the bag and the opening of the bag is pulled through the incision. A bag guard of the like described herein is inserted into the bag and retained near the bag opening and optionally connected to the proximal end of the bag such that the bag opening is kept in an open position. The surgeon grasps the tissue with a grasper and pulls it toward the opening and into the location of the guard. Then, the surgeon uses a scalpel instead of a power morcellator to cut the tissue into smaller pieces and pull them out of the body. The cutting is performed in the location of the guard and/or against the guard so that the bag is not accidentally perforate by the scalpel. The bag with smaller pieces of tissue or no tissue at all is removed from the body cavity along with the bag guard.

The system includes a specimen retrieval receptacle bag **3002** attached to a shaft. The bag **3002** can be deployed inside the body and capture the desired tissue **3006** after it has been detached. Once the specimen **3006** has been placed inside the bag **3002**, there is a semi-rigid ring **3004** attached to the bag opening that can be pulled outside of the body through the laparoscopic wound, incision, opening, orifice access site. After the bag opening ring **3004** has been pulled outside the patient, the lower bag portion that remains in the body cavity with the specimen **3006** contains air channels **3008** that are inflated to create a structure which counteracts the internal pneumoperitoneum pressure and provides an internal anchoring mechanism for the bag **3002**. Then the outer bag opening ring **3004** can be rolled down to retract the wound opening in the same manner as described above. The inflated portion of the bag **3002** that remains inside the body cavity with the specimen **3006** is now exposed to the surface. Once the specimen bag **3002** is retracted in place, the morcellator device **3000** with a center, hollow, spinning blade tube **3010** is attached to the bag opening ring. The morcellator **3000** is locked into a stationary position with the blade tube **3010** inserted down through the wound and into the lower area of the bag **3002** where the specimen **3006** is located. At that point the morcellator **3000** is turned on to allow the blade tube **3010** to rotate. Once the tube **3010** is rotating a tenaculum **3012** is inserted through the hollow blade tube **3010** to grasp the tissue and pull it up into the spinning blade **3010** which reduces the large specimen **3006** into smaller core pieces that can be removed through the small laparoscopic wound site. The morcellator **3000** also contains a camera **3014** at the distal tip of the morcellator **3000** for visualization inside the specimen bag **3002**. When the tissue **3006** has been completely removed or reduced enough in size to pull through the wound site, the morcellator **3000** is detached from the bag ring, the bag **3002** is deflated, and then finally the bag **3002** is pulled through the laparoscopic wound completing the procedure.

Turning now to FIG. **149**, there is shown a system including a power morcellator **4000** and bag **4002** connected to the side of the morcellator shaft **4004**. With additional reference to FIGS. **150**A-**150**D, the morcellator **4000** includes a handle **4006** connected to the shaft **4004** with one or more rotating blades **4008** at the distal end of the shaft **4004**. The morcellator **4000** further includes a motor **4010** located in the handle **4006**. The motor **4010** is connected to and configured to rotate a gear pinion **4012**. The gear pinion **4012** is further connected to a gear train including a gear inner tube **4014** and a gear outer tube **4016**. The gear outer tube **4016** is further connected to a spacer **4018** which is in turn connected to an outer shaft **4020**. The distal end of the outer shaft **4020** is connected to a blade **4008**. The gear inner tube **4014** is connected to an inner shaft **4026** which in turn is connected to a second blade **4022**. The gear outer tube **4016** and gear inner tube **4014** are configured to rotate in opposite directions to create counter-rotating blades at the distal end. With counter rotating tubes there are two tubes. One tube is inside the other. The inner tube is rotating in one direction and the outer tube is rotating in the opposite direction. In one variation, the blade is attached to the end of the outer tube. The concept of counter rotating tubes is to double the relative velocity that the tissue experiences when compared from the perspective of the blade. Every tube configuration can have an outer most tube that retains a blade guard configuration. In another variation, the inner tube is stationary with a rotating outer tube. The outer tube has the blade attached at the end and is allowed to rotate. The concept of a stationary inner tube is to create a slick member that will allow for easier tissue advancement up the working channel. In another variation, a single outer tube rotates and there exists only one tube with the blade attached at the end. The inside of the tube is featureless and smooth. In another variation, there are three tubes in which the inner tube and outer tube are stationary and a middle tube rotates. The blade is attached to the end of the middle rotating tube and protrudes past the inner and outer tubes. The stationary outer tube is to protect anything from being rubbed by the rotating middle tube. The stationary inner tube is to facilitate easier tissue advancement up the tube. In another variation, a riffled tissue advancement tube is provided in a configuration for any tube that is rotating and has unobstructed contact with the tissue on its inside surface. A riffling pattern is formed on the inside surface of the rotating tube which places an axial force on the morcellated tissue causing it to advance upward away from the blade. In yet another variation, an auger-type tissue advancement tube is provided for any rotating inner tube configuration. The tube has multiple flutes traveling the length of the inside of the tube. The ends of the flutes grab the tissue and advance it up the flutes away from the blade. As can be seen in FIG. **150**C, counter rotating tubes **4020**, **4026** are driven from a single gear **4012** and over molded seals or quad ring seals **4046** are provided to seal them as shown in FIG. **1508**. The entire electric motor is enclosed in the handle **4006** and may be powered by a battery or connected to an external power source.

A spring loaded blade guard **4024** operates to cover and uncover the blades **4008**, **4022** and a trigger **4028** operates to activate the motor **4010**. The spring loaded blade guard **4024** operates to only allow the blades **4008** to be exposed once tissue is contacting the end of the blade guard for added safety. The blade guard **4024** shaft with opening(s) and proximal knob may be detachable and the blade guard **4024** may be non-rotating. The inner and outer shafts **4026**, **4020** are concentric and define a working channel **4030** down the middle. At the proximal end, a conical funnel **4032** is provided for easing the insertion of instruments such as graspers into the working channel **4030**. The proximal end of the morcellator **4000** may also be adapted for connection to a specimen receptacle **4034**, shown in FIG. **151**, and a vacuum source for the extraction of morcellated specimen. The specimen receptacle **4034** is a transparent container that includes an inlet port **4038** and a port **4040** for connecting to a vacuum source located on the removable lid. The port **4040** for connected to a vacuum source may include a valve to turn the vacuum on or off and may be configured to be activated electronically. The proximal end of the morcellator **4000** may also be adapted for connecting with a seal assembly **4042** as shown in FIG. **150**D. The seal assembly **4042** may include a zero seal and a septum seal for sealing against an inserted instrument into an opening at the proximal end of the seal assembly **4042**. The seal assembly **4042** may further include a port **4044** for connection to a source of fluid under pressure. The blade guard **4024** includes at least one lateral slot or side window opening **4036** configured to expose the blades through the side for receiving tissue to be morcellated through the side of the morcellator **4000** and into the working channel **4030**. The blade guard **4024** can be rotated or retracted to cover and close the side opening or to expose the blades at the distal opening for receiving tissue to be morcellated into the working channel **4030** at the distal end opening.

Turning now to FIG. **152**, a bag **4002** configured for attachment to a morcellator shaft **4004** having a side opening **4036** will now be described. In one variation of the bag **4002**, the bag **4002** has an open top **4048** with a means for closure **4050**. The morcellator shaft **4004** has a rounded end and is adapted for connection with the bag **4002**. The side of the morcellator shaft **4004** has a windowed opening **4036**. The specimen retrieval system is introduced into the body via a trocar, for example, or via an open wound or body orifice. The bag **4002** is then opened and the tissue specimen is placed into the bag **4002**. The bag **4002** is then sealed with the closure means **4050**. The morcellator shaft **4004** may be attached to the morcellator **4000** and morcellation begins. Alternatively, a bag tube **4066** is provided and the morcellator **4000** is easily attached to the bag tube **4066** by sliding the morcellator shaft **4004** into the bag tube **4066** as shown in FIGS. **152** and **159**. The bag **4002** may be pre-attached to the bag tube **4066**. Once the specimen is reduced the specimen retrieval system is withdrawn from the patient. An example of a morcellator is described in U.S. patent applications Ser. Nos. 12/102,719 and 13/659,462, filed Apr. 14, 2008 and Oct. 24, 2012, respectively, and incorporated by reference in their entireties as if set forth in full herein.

Turning now to FIGS. **153-157**, various bag closure means will be described. In FIGS. **153**A-**153**B, a drawstring **4052** located at the bag top **4048** is employed to close the open top **4048**. In FIGS. **154**A-**154**B, a zip-lock or zippered-style **4054** closure is provided in which a slider can be used to lock and unlock two sides of the closure means to open and close the top **4048**. In FIGS. **155**A-**155**C, another closure means includes a grommet **4056** formed in the bag **4002** near the bag top **4048**. A grasper **4058** or other instrument is inserted into the grommet **4056** opening and then twisted as shown in FIG. **155**C to roll the bag **4002** down and close the open top **4048**. In FIGS. **156**A-**156**B, the top **4048** is provided with a hook-and-loop type fastener **4060**. The opposite sides of the hook-and-loop type fastener are contacted to close the open bag top **4048**. In FIGS. **157**A-B, the bag top **4048** includes a plurality of grommet openings **4062**. In particular, four openings **4062** are provided. An instrument such as a grasper **4058** is used to grasp all of the openings **4062** and then twisted to roll the opening closed as shown in FIG. **157**B.

In order to protect the bag **4002** and prevent it from entering the lateral slot **4036** on the morcellator shaft **4004** and making contact with the rotating blade **4008**, a plastic guard **4064** is provided as shown in FIGS. **158**A-**158**E. The plastic guard **4064** is made of one piece of semi-rigid plastic and configured to fold and be inserted into the morcellator slot **4036**. The plastic guard **4064** is made of material stiffer than the bag **4002** and configured to surround the lateral opening **4036** and provide a trough-like or funnel like opening to spread the bag **4000** away from the opening **4036**. The bag **4002** is attached to the distal end of the morcellator shaft **4004**. The bag **4002** has an open top **4048** with a means for closure **4050**. The bag **4002** also has a semi-rigid structure at the lateral opening **4036** of the morcellator shaft **4004** to allow the tissue to be loaded into the bag **4002** more easily. The specimen retrieval system is introduced into the body via a trocar or open wound or orifice or other delivery mechanism. The bag **4002** is then opened and the tissue specimen is placed into the bag **4002**. The bag **4002** is then sealed via the closure means **4050**. The morcellator **4000** is attached to the proximal end of the morcellator shaft **4004** and morcellation begins. Alternatively, a bag tube **4066** is provided and the morcellator **4000** is easily attached to the bag tube **4066** by sliding the morcellator shaft **4004** into the bag tube **4066** as shown in FIG. **159**. The bag **4002** may be pre-attached to the bag tube **4066** with or without a plastic guard **4064** or reinforced rigid section near the distal opening of the bag tube **4066**. The morcellator shaft **4004** and the bag tube **4066** are held together by friction via a knob that is attached to the bag tube **4066**. The knob interferes with the morcellator handle in a snap or friction fit engagement. Once the specimen is reduced the specimen retrieval system is withdrawn from the patient. The semi-rigid structure of the guard **4064** can be made of spring steel, nitinol or molded plastic. All three variations in the material would permit closure of the bag **4002** by using a drawstring method or pinching the ends and rolling the structure to close the bag **4002**. In another variation shown in FIG. **160**, the bag **4002** is attached to a bag tube **4066**. The bag **4002** has closed ends. The opening **4068** of the bag **4002** is on the side of the bag **4002**. The bag **4002** also has a semi-rigid structure at the opening to allow the tissue to be loaded into the bag more easily. The bag tube **4066** has a rounded end. The side of the bag tube **4066** has a windowed section **4070**. The specimen retrieval system is introduced into the abdomen body via a trocar or open wound. The bag **4002** is then opened and the tissue specimen is placed into the bag **4002**. The bag is then sealed, the morcellator **4000** is attached and morcellation begins. Once the specimen is reduced the specimen retrieval system is withdrawn from the patient. The side opening **4068** can include a reinforcement of spring steel, nitinol or molded plastic located mid-sidewall of the bag **4002**. The side opening **4068** springs open to an oval shape to facilitate easier tissue insertion of the specimen into the bag **4002**. All three variations in the material would close the bag by using a drawstring method or pinching the ends and rolling the structure to close the bag **4002**. In another variation, spring steel, nitinol or molded plastic is located near the bag tube **1066** as shown in FIG. **161**.

In another variation shown in FIGS. **162A-162C**, the bag **4002** is a separate component from the bag tube **4066**. The bag **4002** has two open ends **4072**, **4074**. One opening **4072** is larger than the other. The larger end **4072** is semi-rigid by means of spring steel, nitinol or a plastic member. Different means for closure **4050** such as a drawstring **4052** or pinch and roll down method can be used to seal the large end **4072** of the bag **4002**. The smaller end **4074** has a spring steel or nitinol clamp **4076** that attaches to the bag tube **4066**. The clamp **4076** attaches around the rigid blade guard **4064**. The taper of the rigid blade guard **4064** helps the clamp **4076** to seat on the rim and keep from sliding off the bag tube **4066**. The bag tube **4066** has a rounded end. The side of the bag tube **4066** has a windowed section **4070**. The bag **4002** is first introduced into the abdomen body through an opening, orifice or open wound via trocar, delivery shaft, instrument or other deployment method. The large end of the **4072** bag is then opened and positioned around a tissue sample **4078**. The large end **4072** of the bag **4002** is then sealed. The bag tube **4066** is then introduced into the body. The bag **4002** is then attached to the bag tube **4066** by means of the clamp **4076**. The morcellator **4000** is attached and morcellation begins. Once the specimen **4078** is reduced the retrieval system is withdrawn from the patient.

In another variation shown in FIGS. **163A-163C**, the bag **4002** is attached to a bag tube **4066** named bag tube. The bag **4002** has an open end. The bag tube **4066** has a rounded end. The bag tube **4066** has an over sheath. The sheath tip has two holes to facilitate a nitinol or other flexible semi-rigid drawstring **4052** for opening and closing a semi-rigid bag opening **4068**. The sheath also has two channels parallel to the axis of the tube to facilitate the nitinol retrieval. The side of the tube has a windowed section **4070**. The specimen retrieval system is introduced into the body through an opening as shown in FIG. **1638**. The bag **4002** is then opened by deploying the drawstring **4052** and the tissue specimen **4078** is retrieved by surrounding the specimen **4078** with the net created by the nitinol and bag **4002**. This can be done with or without the assistance of a grasper or dissector. Once the tissue **4078** is surrounded the nitinol can be retrieved proximally via the drawstring **4052** and this causes the bag **4002** to close around the tissue sample **4078** and seal the bag **4002**. The morcellator is attached and morcellation begins. Once the specimen **4078** is reduced the retrieval system is withdrawn from the patient.

In another variation, the bag **4002** has an open top with a semi-rigid ring attached at the top. The bag **4002** can be rolled tightly then deployed into the abdomen via a trocar. The bag **4002** can then be opened inside by manipulation with graspers. The specimen **4078** is loaded into the bag **4002** and the bag **4002** is retrieved through the abdominal wall. The entire bag **4002** does not pass through. The semi-rigid ring is the only portion that is allowed to surface. Morcellation can begin. Once enough of the tissue **4078** is removed, the bag **4002** can then be withdrawn from the patient.

The tissue guard described herein is typically employed with a containment bag. The bag is placed inside the body through a body opening. The body opening refers to any entranceway into the patient and may include and is not limited to incision sites and natural orifices. The target specimen is typically too large to be safely removed through the body opening and requires to be manipulated such as by cutting with a blade in order to extract the target specimen through the body opening. The minimally invasive, laparoscopic body opening is generally smaller than the target specimen size. The target specimen is placed inside the bag and the mouth of the bag is pulled to the outside of the patient. The guard is placed inside the mouth of the bag and anchored across the body opening and the target specimen is pulled into the lumen of the guard. While in the lumen of the guard, the target specimen is in a protected morcellation zone wherein the surgeon may reach in with a blade to cut the target specimen for extraction. The guard protects against the stray blade and also provides a direct cutting surface against which tissue may be placed for reduction. The entire length of the guard typically defines the length of the morcellation zone protecting the bag and the tissue at the margins of the body opening. Additionally, a retractor may be employed. The retractor may be integrally formed with the bag or be a separate stand-alone device. A typical retractor described herein is a two-ringed retractor with a flexible sidewall material located between the two rings. The sidewall of the retractor is configured to be capable of being rolled about the first ring to retract the tissue at the margin of the body opening. If a retractor is employed it may be placed between the marginal tissue and the bag or inside the bag between the bag and the guard. The above description describes different variations of use of the guard, bag and retractor that is employed in manual morcellation. For power morcellation, the guard is inserted inside the bag and morcellation is carried out. In another variation for power morcellation, a stability cap is connected to the proximal ring of the bag or to the proximal end of the guard and power morcellation is carried out. The stability cap serves to locate the vertical position of the blade ensuring that the blade does not extend beyond the predetermined morcellation zone inside the guard or at a short distance safely beyond the distal end of the guard. In another variation for power morcellation, a retractor is employed in which case the retractor is located between the marginal tissue and the bag or between the bag and the guard as previously described and power morcellation is carried out. In the previous variation, a stability cap may be employed in such a manner that it connects to the proximal ring of the retractor, the proximal ring of the bag, or to the proximal end of the guard and morcellation is carried out. In addition to the above variations, any one of the following approaches may be employed in conjunction with any of the variations above when performing a procedure such as a hysterectomy. In one variation, the bag is placed in through the vagina, the target specimen (e.g. uterus) is placed inside the bag while the bag is inside the body cavity, and then the mouth of the bag is pulled through an abdominal incision wherein the guard is inserted into the mouth of the bag, and morcellation, extraction and bag removal take place at the abdominal opening. In another variation, the bag is placed in through the vagina, the target specimen (e.g. uterus) is placed inside the bag while the bag is inside the body cavity, and then the mouth of the bag is pulled back through the vaginal canal wherein the guard is inserted into the mouth of the bag, and morcellation, extraction and bag removal take place at the vagina. In yet another variation, the bag is placed in through an abdominal incision, the target specimen (e.g. uterus) is placed inside the bag while the bag is inside the body cavity, and then the mouth of the bag is pulled through the vaginal canal wherein the guard is inserted into the mouth of the bag, and morcellation, extraction and bag removal take place at the vagina. In one other variation, the bag is placed in through an abdominal incision, the target specimen (e.g. uterus) is placed inside the bag while the bag is inside the body cavity, and then the mouth of the bag pulled back through the abdominal incision wherein the guard is inserted into the mouth of the bag, and morcellation, extraction and bag removal take place at the vagina. In another approach to morcellation of the uterus or other target specimen, the bag may be omitted. In such a case, an incision is made in the abdominal wall, the guard is placed across the incision in the abdominal, the uterus or target specimen is detached and pulled through the central lumen of the guard with morcellation and extraction taking place at the abdominal incision. Alternatively, the target specimen (e.g. uterus) is approached through the vagina, the guard is placed inside the vaginal canal, the target specimen is detached and pulled through the central lumen of the guard with morcellation and extraction taking place at the vagina. As a further variation of the abdominal approach without a bag, the procedure may be observed via a laparoscope inserted through the vagina. As a further variation of the vaginal approach without a bag, the procedure may be observed via a laparoscope inserted through an incision in the abdomen.

In some cases, the guard is not employed. In one such variation without a guard, a bag is placed inside the body cavity via the vaginal canal and the target specimen is placed inside the bag and the mouth of the bag is pulled through an incision in the abdomen, a retractor may be placed inside the bag across the abdominal incision, and morcellation, extraction and bag removal take place at the abdominal incision. In another variation without a guard, a bag is placed inside the body cavity via the vaginal canal and the target specimen is placed inside the bag, and the mouth of the bag is pulled back through the vaginal canal, a retractor may be placed inside the bag inside the vaginal canal, and morcellation, extraction and bag removal take place at the vagina. In another variation without a guard, a bag is placed inside the body cavity via an abdominal incision and the target specimen is placed inside the bag, and the mouth of the bag is pulled through the vaginal canal, a retractor may be placed inside the bag inside the vaginal canal, and morcellation, extraction and bag removal take place at the vagina. In another variation without a guard, a bag is placed inside the body cavity via an abdominal incision and the target specimen is placed inside the bag, the mouth of the bag is pulled through the abdominal incision, a retractor may be placed inside the bag inside the vaginal canal, and morcellation, extraction and bag removal take place at the abdominal incision. In any of the variations without a guard that employ a retractor, employing any of the heretofore mentioned cut-resistant retractors is preferred. Also, in any of the variations without a guard that employ a retractor, the retractor may be placed between the bag and the tissue margin. Also, in any of the variations without a guard that do or do not employ a retractor, employing any of the heretofore mentioned cut-resistant bags is preferred. Power morcellation may also be employed with any of the methods that do employ a guard. In such cases, a stability cap is employed and connected to the proximal end of the bag or proximal ring of the retractor.

In a variation without a guard that employs a retractor, a cut-resistant retractor is provided. The retractor has a first ring and compressible second ring interconnected by a webbing or sidewall. The retractor being configured such that the webbing can be rolled up around the first ring to reduce the length of the retractor and to retract the tissue margin. The bottom ring is inserted through the body opening and resides inside the patient whereas the top ring of the retractor resides above the patient. The top ring is rolled/flipped over itself like the bag to pull the lower ring of the retractor closer and the sidewall into a taut relation between the rings. The lower ring of the retractor advantageously retracts the portion of the bag inside the patent and away from potential damage arising from punctures and tears from the blade. At least part of the webbing is made of puncture-resistant, cut-resistant material. The retractor is configured for insertion into the containment bag and into the body opening to retract the bag and the tissue margin with the first ring of the retractor and mouth of the containment bag residing outside the patient and the second ring of the retractor and the remainder of the containment bag residing inside the patient. This placement of the bag between the retractor and the tissue margin at the body opening anchors the bag with respect to the patient's body. In one variation, only the distal portion of approximately four inches of length of the webbing is cut-resistant being made of KEVLAR, DYNEEMA or other cut-resistant material and the proximal portion of the webbing is not made of cut-resistant material and is made of polyurethane or other flexible film. This arrangement permits the proximal end of the webbing to be more easily rolled around the first ring during retraction. As the length of the webbing is reduced by rolling, the distal cut-resistant portion of the webbing is brought closer to the proximal end or first ring of the retractor and into position for protect morcellation to proceed. With less cut-resistant material, that can be thick and bulky, the retractor is less expensive, and also easier to flip and roll the first ring as less cut-resistant material will be rolled about the first ring. In another variation, the entire webbing is made of cut-resistant material. In another variation for use in the vagina, for example, only the proximal portion of approximately five inches of length of the webbing is cut-resistant being made of KEVLAR, DYNEEMA or other cut-resistant material and the distal portion of the webbing is not made of cut-resistant material and is made of polyurethane or other flexible film for greater flexibility and anchoring at the distal end. In a vaginal surgical procedure, such as a total laparoscopic hysterectomy, the first ring at the proximal end does not have to be rolled down as much. Therefore, the proximal end of the webbing is made of cut-resistant material compared to an abdominal surgical procedure where the webbing is rolled around the first ring quite a bit, the proximal end is not made of cut-resistant material.

According to one aspect of the invention, a contamination prevention system for manual or power in-situ morcellation is provided. The system includes a containment bag having a mouth and a shield configured to be removably inserted into the mouth of the bag. The shield has a central lumen that provides a working channel for morcellation and protects the bag and surrounding tissue.

According to another aspect of the invention, a device for safely removing a tissue specimen from a body cavity through a body opening that is smaller than the tissue specimen is provided. The device includes a removable shield configured to be anchored in the body opening. The device further includes a bag or retractor located between the body opening and the shield.

According to another aspect of the invention, a shield having a sidewall defining a central opening is provided. The shield includes a C-shaped, concave outer surface for anchoring the shield in a body opening.

According to another aspect of the invention, a shield having a sidewall defining a central opening is provided. The shield includes a C-shaped, concave outer surface for anchoring the shield in a body opening. The shield is split such that one part of the shield is nested within another part of the shield and the shield is expandable from a reduced lateral configuration to an enlarged lateral configuration and vice versa by varying the nested portion of the shield.

According to another aspect of the invention, an expandable shield having a sidewall defining a central opening is provided. The shield is movable between a first configuration and a second configuration. The first configuration having a dimension larger than the dimension when in the second configuration wherein the dimension is a vertical and/or a lateral dimension.

According to another aspect of the invention, a system for preventing the potential spreading of cancerous cells when removing a large tissue specimen from a small opening in the body is provided. The system includes a container and a morcellation zone. The morcellation zone is insertable into and removable from the container. The morcellation zone protects the container from penetration by morcellating instruments.

According to another aspect of the invention, a shield is provided. The shield includes a blade connected to the shield. The blade is movable along a predetermined pathway with respect to the shield and the shield surrounds at least part of the predetermined pathway to protect tissue surrounding a body opening.

Turning now to FIGS. **164-167**, a shield **5000** according to the present invention is shown. The shield **5000** includes a band of flexible, cut-resistant material. The shield **5000** has an inner surface **5002** and an outer surface **5004** interconnected by a top end **5006** and a bottom end **5008** and a first end **5010** and a second end **5012**. The band is configured to define a central lumen having a longitudinal axis. The central lumen has a lumen diameter that is perpendicular to the longitudinal axis. The lumen diameter may vary along the longitudinal axis. For example, the inner surface **5002** defines a shape such as a convex shape wherein the lumen diameter is larger at the top end **5006** and bottom end **5008** relative to the lumen diameter at the center or waist of the band as shown in FIGS. **164-167**. In one variation, the inner surface **5002** defines a constant lumen diameter from the top end **5006** to the bottom end **5008**, or an angled or funnel-like shape or other curve or shape. The outer surface **5004** substantially matches the inner surface **5002** in shape to define a band of substantially uniform thickness; however, the invention is not so limited and the outer surface **5004** may take a shape that is different from the inner surface **5002** and/or have a band thickness that is different along the longitudinal axis. A curved, funnel-like or C-like, concave shape of the outer surface **5004** as discussed above in this specification helps to anchor the shield **5000** at the tissue margin when inserted into a body orifice, incision site or other opening. Also, the larger diameter shape at the top end **5006** assists in providing a cutting board surface for performing manual morcellation and protecting the surrounding tissue. For example, a flatter and more planar orientation of the top end **5006** in which the inner surface **5002** faces upwardly and perpendicularly or nearly perpendicularly to the longitudinal axis and the outer surface **5004** faces downwardly onto the tissue such as downwardly onto the abdominal wall forms a larger protective overlay or larger cutting board-like surface. As shown in the variation of FIGS. **164-167**, the outer surface of the band has a concavity or curvature along the longitudinal axis from the top end **5006** to the bottom end **5008** and extending circumferentially around the guard from the first end **5010** to the second end **5012**. The shield **5000** is made of flexible, resilient material such as plastic and is molded to have a resting configuration defining a resting lumen diameter. The resting configuration is shown in FIGS. **164-166** wherein a gap is defined between the first end **5010** and the second end **5012**. The gap is approximately 5-10 degrees having an arc length of approximately 4-6 mm. The resting lumen diameter at the waist is approximately 40 mm. Because the shield **5000** is resilient and flexible, its lumen diameter is adjustable by flexing and turning the band inwardly to reduce the gap, and to overlap the first end **5010** and second end **5012** of the band to reduce the lumen diameter or by flexing and bending the band outwardly to increase the gap and increase the lumen diameter relative to the resting lumen diameter. From an increased or reduced lumen diameter relative to the resting lumen diameter, the band will tend to spring back toward approximately the resting configuration and resting lumen diameter because of its resilient nature. In one variation, the resting configuration does not have a gap. As the band is reduced in diameter, the first end **5010** will overlap the second end **5012** to form a spiral shape when viewed from the top or bottom. The outer surface **5004** of the band at the first end **5010** will face at least a portion the inner surface **5002** of the band at the second end **5012** resulting in part of the band near the first end **5010** being nested within part of the band near the second end **5012**. To accommodate the nested first end portion of the band, the second end portion is configured to jog outwardly by a distance **5014** approximately equal to the width of the band wall, that is, the width of material between the inner surface **5002** and the outer surface **5004**, which is approximately 1-3 mm such that, when the band is nested, the inner surface **5002** retains a larger inner diameter that is not reduced by the overlapped segment of the band in the location of the overlap and such that the inner surface is substantially flush at the intersection with the overlapping location as can be seen in FIG. **167**. An inner ridge surface **5016** is formed in the shield **5000** by an outwardly extending jog or irregularity in the inner surface of the band defined by an increased lumen diameter. The increased lumen diameter extends along a portion of the circumference of the band from the ridge **5016** to the second end **5012**. The inner ridge **5016** is formed approximately 127 degrees from the second end **5012**. The inner ridge **5016** is formed with respect to the inner surface **5002** and extends substantially perpendicularly from the inner surface **5002** in a vertical fashion from the top end **5006** to the bottom end **5008**. The inner ridge **5016** forms a corresponding outer ridge **5018** as the band is molded to create the jog at the inner ridge **5016** where the band increases in inner diameter by a segment distance **5014** of approximately 127 degrees around the circumference from the inner ridge **5016** to the second end **5012**. Between the inner ridge **5016** and the second end **5012**, at least one abutment is formed extending along the longitudinal axis between the top end **5006** and the bottom end **5008**.

A first inner abutment **5020** is formed on the inner surface **5002**. The surface of the first inner abutment **5020** faces the second end **5012** and is substantially perpendicular to the inner surface **5002** and extends outwardly from the inner surface **5002** and along the longitudinal axis between the top end **5006** and the bottom end **5008**. The first inner abutment **5020** has a height from the inner surface **5002** approximately equal to or greater than the thickness of the band material between the inner surface **5002** and the outer surface **5004**. When the first end **5010** overlaps the second end **5012** such that the outer surface **5004** at the first end **5010** overlays and faces the inner surface **5002** at the second end **5012** in a first reduced configuration, the first end **5010** is configured to contact the first inner abutment **5020** to lock and prevent further reduction in the size of the inner diameter. This configuration serves to lock the shield **5000** in a fixed diametrical/lateral dimension position with the shield **5000** maintaining some degree of overlap circumferentially around a portion of the perimeter of the shield **5000**. This lock is particularly useful when the shield **5000** is located inside a body orifice or incision where forces of the tissue would tend to collapse the central lumen and further reduce the inner diameter. The central lumen serves as a working channel and the lock is created when at least a portion of the shield **5000** contacts the first inner abutment **5020**. The first inner abutment **5020** is located approximately 30 degrees from the second end **5012**. When the first end **5010** contacts the first inner abutment **5020**, the inner diameter is approximately 36 mm.

The shield **5000** further includes a second inner abutment **5022** located a greater distance from the second end **5012**. In particular, the second inner abutment **5022** is located approximately 65 degrees from the second end **5012**. The second inner abutment **5022** is formed on the inner surface **5002**. The surface of the second inner abutment **5022** faces the second end **5012** and is substantially perpendicular to the inner surface **5002** and extends outwardly from the inner surface **5002** and along the longitudinal axis between the top end **5006** and the bottom end **5008**. The second inner abutment **5022** has a height from the inner surface **5002** approximately equal to or greater than the thickness of the band material between the inner surface **5002** and the outer surface **5004**. The first inner abutment **5020** and the second inner abutment **5022** are substantially parallel. When the first end **5010** overlaps the second end **5012** such that the outer surface **5004** at the first end **5010** overlays and faces the inner surface **5002** at the second end **5012** in a reduced diametrical/lateral configuration, the first end **5010** is configured to contact either the first inner abutment **5020** or the second inner abutment **5022** to lock and prevent further reduction in the size of the inner diameter. The second inner abutment **5022**, like the first inner abutment **5020** serves to lock the shield **5000** in a fixed diametrical/lateral dimension position with the shield **5000** maintaining some degree of overlap circumferentially around the perimeter of the shield **5000**. This lock is particularly useful when the shield **5000** is located inside a body orifice or incision where forces of the tissue would tend to collapse the central lumen and further reduce the inner diameter. The central lumen serves as a working channel and the lock is created when at least a portion of the shield **5000** contacts the second inner abutment **5020**. When the first end **5010** contacts the second inner abutment **5022**, the inner diameter is approximately 33 mm. When the first end **5010** contacts the second inner abutment **5022**, the first inner abutment **5020** is located against the outer surface **5004**. To accommodate the first inner abutment **5020**, a first outer abutment **5024** or receiving area **5024** is formed in the outer surface **5004**. In one variation as shown, the receiving area **5024** includes an abutment formed therein and in another variation, the receiving area is not configured to have an abutment surface. The first outer abutment **5024** is located approximately 30 degrees from the first end **5010**. The first outer abutment **5024** is formed on the outer surface **5004**. The surface of the first outer abutment **5024** faces the first end **5010** and is substantially perpendicular to the outer surface **5004** and extends inwardly from the outer surface **5004** and along the longitudinal axis between the top end **5006** and the bottom end **5008**. The first outer abutment **5024** has a height with respect to the outer surface **5004** approximately equal to or greater than the thickness of the band material between the inner surface **5002** and the outer surface **5004**. The first outer abutment **5024** and the first inner abutment **5020** and second inner abutment **5022** are substantially parallel. When the first end **5010** overlaps the second end **5012** such that the first end **5010** contacts the second inner abutment **5022**, the first inner abutment **5020** faces and contacts the first outer abutment **5024** to lock and prevent further reduction in the size of the inner diameter.

The shield **5000** further includes a third inner abutment **5026** located a greater distance from the second end **5012**. In particular, the third inner abutment **5026** is located approximately 100 degrees from the second end **5012**. The third inner abutment **5026** is formed on the inner surface **5002**. The surface of the third inner abutment **5026** faces the second end **5012** and is substantially perpendicular to the inner surface **5002** and extends outwardly from the inner surface **5002** and along the longitudinal axis between the top end **5006** and the bottom end **5008**. The third inner abutment **5026** has a height from the inner surface **5002** approximately equal to or greater than the thickness of the band material between the inner surface **5002** and the outer surface **5004**. The first inner abutment **5020**, the second inner abutment **5022** and the third inner abutment **5026** are substantially parallel and approximately equally spaced apart around the circumference of the inner surface **5002**. When the first end **5010** overlaps the second end **5012** such that the outer surface **5004** at the first end **5010** overlays and faces the inner surface **5002** at the second end **5012** in a reduced diametrical/lateral configuration, the first end **5010** is configured to contact either the first inner abutment **5020**, the second inner abutment **5022**, or the third inner abutment **5026** to variably adjust the inner diameter and then to lock and prevent further reduction in the size of the inner diameter. The third inner abutment **5026**, like the first inner abutment **5020**, and the second inner abutment **5022** serves to lock the shield **5000** in a fixed diametrical/lateral dimension position with the shield **5000** maintaining some degree of overlap circumferentially around the perimeter of the shield **5000**. This lock is particularly useful when the shield **5000** is located inside a body orifice or incision where forces of the tissue would tend to collapse the central lumen and further reduce the inner diameter. When the first end **5010** contacts the third inner abutment **5026**, the inner diameter is approximately 30 mm. When the first end **5010** contacts the third inner abutment **5024**, the first inner abutment **5020** and the second inner abutment **5022** are located against the outer surface **5004**. To accommodate the first inner abutment **5020** and the second inner abutment **5022**, a first outer abutment or receiving area **5024** is formed is in the outer surface **5004** and a second outer abutment or receiving area **5028** is formed in the outer surface **5004**. In one variation, the receiving area is provided with an abutment surface and, in another variation, the receiving area is sized and configured to accommodate the inner abutments in a flush manner. The second outer abutment **5028** is located approximately 65 degrees from the first end **5010**. The second outer abutment

5028 is formed on the outer surface 5004. The surface of the second outer abutment 5028 faces the first end 5010 and is substantially perpendicular to the outer surface 5004 and extends outwardly from the outer surface 5004 and along the longitudinal axis between the top end 5006 and the bottom end 5008. The second outer abutment 5028 has a height from the outer surface 5004 approximately equal to the height of the inner abutments or the thickness of the band material between the inner surface 5002 and the outer surface 5004. The second outer abutment 5028, the first outer abutment 5024 and the first inner abutment 5020, the second inner abutment 5022, and the third inner abutment 5026 are substantially parallel. When the first end 5010 overlaps the second end 5012 such that the first end 5010 contacts the third inner abutment 5026, the first inner abutment 5020 faces and contacts the second outer abutment 5028 and the second inner abutment 5022 faces and contacts the first outer abutment 5020 to lock and prevent further reduction in the size of the inner diameter.

The shield 5000 further includes a third outer abutment 5030 located a greater distance from the first end 5010 than the second outer abutment 5028. In particular, the third outer abutment 5030 is located approximately 100 degrees from the first end 5010. The third outer abutment 5030 is formed on the outer surface 5004. The surface of the third outer abutment 5030 faces the first end 5010 and is substantially perpendicular to the outer surface 5004 and extends inwardly from the outer surface 5004 and along the longitudinal axis between the top end 5006 and the bottom end 5008. The inward extension of the outer abutments creates ramp-like surfaces on the inner surface 5002. The third outer abutment 5030 has a height from the outer surface 5004 approximately equal to or greater than the thickness of the band or inner abutments. The third outer abutment 5030 is configured to accommodate and receive the first inner abutment 5020 when the first end 5010 abuts the inner ridge 5016 as shown in FIG. 167. In another variation, first end 5010 abuts a fourth inner abutment that is not configured as an inner ridge 5016 as described herein. The first inner abutment 5020, the second inner abutment 5022 and the third inner abutment 5026 are substantially parallel. When the first end 5010 overlaps the second end 5012 such that the outer surface 5004 at the first end 5010 overlays and faces the inner surface 5002 at the second end 5012 in a reduced diametrical/lateral configuration, the first end 5010 is configured to contact either the first inner abutment 5020, the second inner abutment 5022, the third inner abutment 5026 or the inner ridge 5016 to variably adjust the inner diameter and then to lock and prevent further reduction in the size of the inner diameter. In one variation, all of the inner abutments including the inner ridge are substantially equally spaced apart. The first end 5010 is shown contacting the inner ridge 5016 in FIG. 167 to configure a shield 5000 having the smallest relative inner diameter of approximately 28 mm. When the first end 5010 contacts the inner ridge 5016, the first inner abutment 5020, the second inner abutment 5022, and the third inner abutment 5026 are located against the outer surface 5004 and, in particular, received in or against the third outer receiving area or abutment 5030, second outer receiving area or abutment 5028 and the first outer receiving area or abutment 5024, respectively. To unlock the shield 5000, the inner-nested segment of the shield 5000, the first end 5010 is moved toward the longitudinal axis to release the abutting surfaces. The first end 5010 is demarcated with a marker 5032 such as a tab, grip having a textured surface, or a contrast colored area such as near the top end 5006 or bottom end 5008 to serve as an indicator to the user which end of the shield 5000 is to be nested within the shield 5000 so that the abutments interlock accordingly. Also, the marker 5032 facilitates withdrawal or release of the shield 5000 from the locked configuration by providing a textured location to pull or grasp the shield. The marker 5032 may further serve a directional purpose indicating to the user which side of the shield is up if the shield is asymmetrical along the longitudinal axis.

Although three inner abutments 5020, 5022, 5026, three outer abutments 5024, 5028, 5030 and one inner ridge 5016 have been described having certain spacings and angular relationships, the invention is not so limited and any number of inner abutments may be provided to provide the variable locking configurations to achieve the desired inner diameter of the working channel. Furthermore, although the gap is shown to be approximately 8 degrees in the relaxed configuration, the invention is not so limited, and the shield 5000 may have a larger gap, smaller gap or no gap. As described above, the shield 5000 is designed such that the first end 5010 serves as a functional locking edge that contacts an abutment, in particular, one or more inner abutments 5020, 5022, 5026 and/or one or more inner ridge 5016 at a time to variably select and fix the inner diameter. In another variation, the first end 5010 does not serve as a functional edge and instead an outer abutment serves as a functional locking edge as it contacts and abuts one or more inner abutments 5020, 5022, 5026. And in yet another variation of the shield as described above, the first end 5010 and one or more outer abutments 5024, 5028, 5030 serve as functional locking edges wherein one or more than one abutment are simultaneously in contact at a fixed diametrical position. Each inner abutment forms a triangular-like ramped protrusion from the inner surface 5002 and the outer abutments form correspondingly shaped, yet larger triangular-like ramped indentations or protrusions into the outer surface 5004 configured to receive the smaller inner abutments such that the one or more inner abutment surfaces come into contact with the one or more outer abutments or are simply received in receiving areas without contact against outer abutments. In one variation, the shapes of the inner and outer abutments may further include friction-fit or snap-fit configurations to further enhance locking ability where features include ridges that provide the increased frictional lock, ledge or gate. The ramped protrusion at the inner surface 5002 facilitates expansion of the shield from a reduced configuration to an enlarged configuration. For example, when inserting the shield into an incision/orifice, the shield 5000 is first curled into a reduced configuration so that it can fit into a small incision/orifice and then the shield 5000 is uncurled into a larger diameter configuration. As the reduced configuration is uncurled into a larger diameter configuration, portions of the outer surface 5004 will ramp up and over the ramped protrusions on the inner surface 5002. After the outer surface ramps over the inner surface, the inner abutments will come into contact with the outer abutments to create a first stop or locked position. The shield 5000 can then be uncurled further and the outer surface ramped over an inner surface protrusion in the location of the outer abutment to then come to another locked position wherein the inner abutments and the outer abutments come into contact with each other and so forth. As such, the expansion of the shield is performed in a ratchet-like fashion in which the diametrical dimension increases by degrees in a stepwise manner between locking interaction with one or more abutment. In one variation, the shield 5000 does not have an outer abutment formed in the outer surface. Instead, the shield 5000 has a receiving area for receiving the inner abutments over which the outer surface overlays to provide a flush locking position wherein the locking function is performed when an inner abutment contacts the first end **5010** or, in one variation, one or more outer abutment formed in one or more receiving area. As such, the receiving area that is not configured for abutment formed in the outer surface **5004** can have any shape at the outer surface. The inner surface in the location opposite from the receiving area may have the ramped configuration or other curved configuration that facilitates movement of the shield between a reduced configuration and an enlarged configuration. This ramping feature advantageously makes the shield **5000** easy to use because uncurling the shield into a larger diameter does not require a separate step to mechanically unlock a locked configuration. Instead, the shield is simply curled or otherwise moved circumferentially to ramp over an inner protrusion to enter an adjacent locked position of abutment in ratchet-like fashion.

The shield **5000** shown in FIGS. **164-167** is adjustable to have four distinct inner diameter sizes. When inserted inside an incision or body orifice the shield **5000** provides protection and can conform to incisions of approximately one inch and smaller. Of course, a larger shield **5000** can be made to be placed inside larger incisions/orifices such as the vaginal canal. Such a shield may also be made to have a length that is longer than the one shown in FIGS. **164-167**. The shield **5000** provides retraction of tissue at the incision/orifice. When inserted into an incision/orifice, the shield **5000** is curled into a reduced configuration to be inserted into a small incision/orifice and then the shield **5000** is uncurled into a larger diameter configuration with a plurality of locking positions available to customize the locking position of the shield. As such, the shield **5000** serves the function of retraction, enlarging the incision or orifice simultaneous with the enlargement of the shield diameter and working channel. With the shield **5000** of FIGS. **164-167**, the shield provides retraction and can conform to incisions up to approximately 1.5 inches in diameter. The retraction of surrounding tissue will increase the working space and provide better stability for the user.

Furthermore, the shield **5000** locking mechanism is unique as it relies on radial pressure exerted onto the shield **5000** from the outside and onto the outer surface **5004**. Hence, the shield **5000** and, in particular, the locking mechanism of the shield, in one variation, functions when the shield is inserted into an incision size equal to or less than the inner diameter of the smallest reduced configuration of the shield. The surrounding tissue will exert a radial force circumferentially around the outer perimeter of the shield **5000** that forces the first end **5010** into abutment with one or more of the inner abutments or inner ridge and/or forces one or more inner abutment into abutment with one or more outer abutment. The surrounding tissue margin exerts a compressive force onto the shield. The shield is configured to take advantage of the force component that is tangential to the circumference of the shield to move the perpendicular abutments both inner and/or outer, and/or ridge and/or first end into contact with one or more other abutment or ridge, first end or other perpendicular structure, thereby, preventing the collapse of the shield while at the same time providing a locking feature. The structures of the shield that are perpendicular to the circumferential surfaces such as the abutments/ends/ridges support the structure and reinforce it making the shield stronger. Variations of the shield having locking positions and configurations in which more than one pair of abutment surfaces are in contact simultaneously for a giving locking position make the shield stronger and more capable of withstanding forces tending to collapse a retracted tissue position. To further increase the radial strength of the shield while retracting tissue and subject to tissue pressure surrounding the shield when inside a tissue opening any one or more of the abutments/ridges/ends that form contact surfaces that serve a locking function extend from the top end **5006** or nearly the top end **5006** to the bottom end **5008** or nearly the bottom end **5008**, or at least equal to or greater than 50 percent surface length of shield in order to provide strength and substantially uniform reinforcement along the a length of the shield from the top to the bottom. The tissue pressure onto the shield while it is located in an incision/orifice forces the leading edge and the outer abutments into the corresponding inner abutments and also allows the overlapping faces of the shield to sit flush within the shield due to the ridge and jog formed in the shield, the distance of which equals the width of the shield wall. Without the tissue pressure onto the shield, a shield that is configured into a reduced configuration in which surfaces are in abutment will not remain in the reduced and locked configuration because the shield is molded and biased towards a larger resting configuration. Hence, the lock is a living lock requiring tissue pressure to effect a locked configuration in one variation. The tissue pressure at the locus of incision/orifice cooperates to bring the abutment surfaces into a locking configuration and keeping it there. In use, the shield is placed into a reduced configuration from a resting configuration by first closing the gap and bringing the first end of the band into an overlapping configuration with at least part of the second end of the band. The overlapping portion is increased by curling down the band to further reduce the inner diameter to a size that will fit into an incision/orifice. The shield is inserted into the incision/orifice and released inside the incision/orifice and is subjected to pressure from the surrounding tissue arising from the incision/orifice diameter being smaller than the reduced configuration of the shield or arising from increasing the size of the shield by uncurling it from the reduced configuration. The shield is curled in a reverse direction to increase the inner diameter of the shield. Increasing the inner diameter will tend to retract tissue at the margin of the incision/orifice. The retraction of tissue will increase the bias force of the tissue back onto the shield. Reducing the amount of overlapping shield will ratchet the abutments into consecutive locked positions in which one or more abutments are in contact with each other or with an end or ridge. Contact with the abutments will prevent collapse of the shield and will fix the inner diameter. When viewed from the top along the longitudinal axis of the shield, the shield will form a spiral shape in a plane perpendicular to the longitudinal axis when it is in a reduced configuration. When in a resting configuration, the shield forms an open circle or open ellipse in one variation. In another variation, the first end of the shield slightly overlaps at the second end of the shield. The locking mechanism in cooperation with the tissue pressure serves to anchor the shield within the incision/orifice. An aggressive C-shaped curvature of the outer surface is not as necessary to help anchor the shield into the incision/orifice because of the lock. Without a lock, wedging a lower flange of an aggressive C-shaped outer surface into the incision/orifice and resting an upper flange against the tissue surface helps to anchor the shield with respect to the patient. The locking mechanism advantageously allows the working channel and inner diameter to be maximized without it being decreased by an aggressive C-shaped curvature to the sidewall of the band. In one variation, the shield does not have a curved profile or only a very slightly curved profile in order to maximize the inner diameter with greater reliance on the locking mechanism to anchor the shield with respect to the patient. The outward jog at the second end of the band further maximizes the inner diameter in the location where one portion of the band overlaps with another portion of the band creating a uniform and flush inner diameter instead of the inner diameter being reduced in the location of the overlap. In one variation, the shield does not have outer abutments, but instead, has receiving areas sized and configured to receive the inner abutments when the shield is spiraled to overlap inner abutments. The receiving areas prevent the overlapping band from buckling inwardly toward the central lumen. Instead, the inner abutments are received within the receiving areas to maximize the inner diameter and to create a flush arrangement of the band around the inner diameter even in the location of the overlapping portion of the band. In the most reduced configuration, in which the shield has the smallest inner diameter, the first end contacts the inner ridge and all of the inner abutments are either received in the receiving areas or are in contact with corresponding outer abutments.

Turning now to FIG. **168**, there is shown another shield **5000** to illustrate another locking mechanism according to the present invention wherein like reference numbers are used to describe like parts. The first end **5010** includes a projection **5034** sized and configured to fit inside a slot **5036** formed in the second end **5012**. The abutment of the projection **5034** against the slot **5036** creates a locking configuration and prevents further reduction in the inner diameter. As seen in FIG. **168**, the slot **5036** is substantially vertically orientated and the slot **5034** is curved to conform to the curvature of the shield band. Although one slot **5036** is shown, a plurality of slots **5036** may be provided to afford variability in locking diameters.

Turning now to FIGS. **169-170**, there is another variation of a locking shield **5000**. The shield **5000** includes a first end **5010** configured to slide into a slot **5036** formed at the second end **5012**. A plurality of slots **5036** is provided to afford variability in locking diameters. Each slot **5036** is substantially C-shaped forming a tongue **5038** behind which the first end **5010** is inserted to fix the inner diameter. The shield **5000** is unlocked by increasing the diameter by pulling apart the interlocked segments of the band.

Turning now to FIG. **171**, there is another variation of a shield **5000** having a locking mechanism. The shield **5000** includes one or more vertical slots **5036** formed at the second end **5012**. A plurality of slots **5036** is provided to afford the shield **5000** with variable locking positions. The first end **5010** includes a projection **5034** having an outwardly extending hook **5040** that is sized and configured to be received inside any one of the slots **5036**. The hook **5040** abuts the slot **5036** openings to restrain reduction or expansion of the inner diameter. The lock is released by flexing the first end **5010** inwardly to remove the hook **5040** from the slot **5036** opening.

Turning now to FIGS. **172-174**, there is shown another variation of a shield **5000** having a locking mechanism. The shield **5000** includes a first end **5010** provided with one or more apertures **5042**. A plurality of apertures **5042** is provided to afford variable locking positions along the band to adjust the inner diameter and lock it into place as desired. The second end **5012** of the shield **5000** includes a projection **5034**. The projection **5034** includes a circular head connected to a neck portion **5044**. The projection **5034** extends radially inwardly from the inner surface **5002** of the band. Each aperture **5042** has two parts. The first part of the aperture **5042** includes an opening that is shaped to correspond to the head of the projection **5034** and sized to permit the head of the projection **5034** to pass into the aperture **5042** as shown in FIG. **172**. As shown in FIG. **174**, the projection **5034** is then moved into the second part of the aperture **5034** that forms a channel for the neck portion **5044** and a constraint for the head portion such that when the projection **5034** resides inside the second part of the aperture **5034**, the head portion cannot be removed unless the head portion is aligned with the first part of the aperture **5034** and passed therethrough. The slot-lock fixes the head portion of the projection **5034** at the second end **5012** in one of the apertures **5042** along the first end **5010** to fix and lock the inner diameter and prevent it from being expanded or reduced in size.

Turning now to FIG. **175**, there is shown another variation of a shield **5000** having a locking mechanism. The lock includes a projection **5034** extending outwardly from the outer surface **5004** near the first end **5010**. The projection **5034** is vertically oriented. The second end **5012** includes one or more correspondingly-shaped, vertically oriented slots **5036**. A plurality of slots **5036** is provided for variability in the adjustment of the size and inner diameter of the shield **5000**. The first end **5010** is flexed inwardly and nested inside the second end **5012** to spiral the shield **5000** into a smaller inner diameter. When the desired inner diameter is achieved for the particular surgical purpose, the projection **5034** is aligned with the desired slot **5036** for the desired inner diameter and the projection **5034** is inserted into the slot **5036**. The projection **5034** abuts the slot **5036** preventing the expansion or reduction in size and inner diameter of the shield **5000**, thereby, locking the inner diameter of the shield **5000** in the desired configuration. To unlock the shield **5000**, the projection **5034** is reversed and pushed back out of the slot **5036** by flexing the first end **5010** inwardly or the second end **5012** outwardly to release the projection **5034** from the slot **5036**. In the unlocked configuration, the inner diameter may be reduced in sized so that it can be easily pulled out of the incision or body orifice. The shield **5000** may be readjusted to have an increased or decreased inner diameter and re-locked as desired while resident in the incision/orifice.

Turning now to FIG. **176**, there is shown another variation of a shield **5000** having a locking mechanism. The lock includes one or more projection **5034** extending outwardly from the inner surface **5002** near one of the first end **5010** and second end **5012**. The projection **5034** is oriented horizontally, perpendicular to the inner surface **5002** and/or the longitudinal axis. In FIG. **176**, one projection **5034** is located near the top end **5006** and another projection (not shown) is located near the bottom end **5008**. The second end **5012** includes one or more correspondingly-shaped, horizontally oriented slots **5036** that are sized and configured to receive the one or more projections **5034**. A plurality of slots **5036** is provided along the circumference of the shield **5000** to provide variability in the adjustment of the size and inner diameter and locking positions of the shield **5000**. The first end **5010** is flexed inwardly and nested inside the second end **5012** to spiral the shield **5000** into a smaller inner diameter. When the desired inner diameter is achieved for the particular surgical purpose, size of incision, orifice or tissue to be extracted, the one or more projection **5034** is aligned with a corresponding one or more slot **5036** for the desired inner diameter. Each projection **5034** is inserted into the corresponding slot **5036**. The projection **5034** abuts the slot **5036** preventing the expansion or reduction in size and inner diameter of the shield **5000**, thereby, locking the inner diameter of the shield **5000** in the desired configuration. The top end **5006** and the bottom end **5008** are uniformly locked with respect to each other. To unlock the shield **5000**, the projection **5034** is pushed back out of the slot **5036** by flexing the first end **5010** inwardly or the second end **5012** outwardly to release the projection **5034** from the slot **5036** to achieve an unlocked configuration. In the unlocked configuration, the inner diameter may be reduced in sized so that it can be easily pulled out of the incision or body orifice. The shield **5000** may be readjusted to have an increased or decreased inner diameter and re-locked as desired while resident in the incision/orifice.

Turning now to FIG. **177**, there is shown another variation of a shield **5000** having a locking mechanism. The lock includes at least one abutment **5020** extending outwardly from and perpendicular to the inner surface **5002** near the second end **5012**. The abutment **5020** is vertically oriented extending between the top end **5006** and the bottom end **5008**. A plurality of abutments **5020** is provided and each is spaced apart from each other from the second end **5012** to provide variability in the adjustment of the size and inner diameter of the shield **5000**. The plurality of abutments **5020** form a step-like arrangement of a plurality of curved steps along the inner surface **5002** against which the first end **5010** is configured to abut. The first end **5010** is a curved edge that corresponds to the curvature of the shield **5000**. Any size and shape abutment may be provided at one location together with a correspondingly shaped abutment such as the first end **5010** on the other side of the shield **5000** or other location along the inner or outer surface of the shield. The first end **5010** is flexed inwardly and nested inside the second end **5012**. The shield is spiraled into a smaller inner diameter. When the desired inner diameter is achieved for the particular surgical purpose, the first end **5010** or other abutment at or near the first end **5010** is aligned and placed into contact with one of the abutments **5020** near or at the other side or the second end **5012** of the shield **5000**. The contact of the first end **5010** with the abutment **5020** creates a lateral/diametrical lock that prevents reduction in the size of the shield and its inner diameter. This lock configuration, however, permits expansion of the lateral/diametrical dimension. If expansion occurs, the first end **5010** may be moved into contact with an adjacent abutment **5020** and snap against it to create another locking position. To release the lock, the first end **5010** is moved out of contact with the abutment **5020** to free the variability of shield size. In the unlocked configuration, the inner diameter may be reduced in sized so that it can be easily pulled out of the incision or body orifice. The shield **5000** may be readjusted to have an increased or decreased inner diameter and re-locked as desired.

Turning now to FIG. **178**, there is shown another variation of a shield **5000** having a locking mechanism. The lock includes at least one abutment **5020** extending outwardly from and perpendicular to the inner surface **5002** near the second end **5012**. The abutment **5020** is vertically oriented extending between the top end **5006** and the bottom end **5008**. A plurality of abutments **5020** is provided and each is spaced apart from each other from the second end **5012** to provide variability in the adjustment of the size and inner diameter of the shield **5000**. The plurality of abutments **5020** form a step-like arrangement of a plurality of curved steps along the inner surface **5002** against which the first end **5010** is configured to abut. The first end **5010** is a curved edge that corresponds to the curvature of the shield **5000**. Any size and shape abutment may be provided at one location together with a correspondingly shaped abutment such as the first end **5010** on the other side of the shield **5000** or other location along the inner or outer surface of the shield. The shield **5000** further includes one or more projection **5034** extending outwardly from the inner surface **5002** and located adjacent to the at least one abutment **5020**. One projection **5034** is provided adjacent to each abutment **5020**. In the variation, shown in FIG. **178**, three abutments **5020** are shown and three projections **5034** are shown adjacent to each abutment **5020**. The projection **5034** is cylindrical in shape but can be any shape. The abutments **5020** and the projections **5034** are associated with the second end **5012** of the band. The band includes one or more apertures **5042** formed at or near the first end **5010**. The apertures **5042** are sized and configured to receive the projections **5034** and spaced apart such that in one diametrical arrangement of the shield **5000**, all of the projections **5034** are insertable into corresponding apertures **5042**. The first end **5010** is flexed inwardly and nested inside the second end **5012**. The shield is spiraled into a smaller inner diameter. When the desired inner diameter is achieved for the particular surgical purpose, the first end **5010** or other abutment at or near the first end **5010** is aligned and placed into contact with one of the abutments **5020** near or at the other side or the second end **5012** of the shield **5000**. In doing so, the corresponding one or more projections **5034** is passed through the corresponding aperture **5042** to lock the shield into place. The contact of the first end **5010** with the abutment **5020** creates a lateral/diametrical lock that prevents reduction in the size of the shield and its inner diameter. The abutment of the projection **5034** against the aperture **5042** further creates a lateral/diametrical lock that prevents the increase as well as the reduction in the size of the shield and its inner diameter. To release the lock, the one or more projection **5034** of the second end **5012** is moved out of the one or more apertures **5042** of the first end **5042** and the first end **5010** is moved out of contact with the abutment **5020** to free the variability of shield size. In the unlocked configuration, the inner diameter may be reduced in sized so that it can be easily pulled out of the incision or body orifice. Of course, the shield **5000** may be readjusted to have an increased or decreased inner diameter and re-locked as desired.

Turning now to FIGS. **179-180**, there is shown another variation of a shield **5000** having a locking mechanism. The shield **5000** includes a plurality of corrugations **5046** around band or in at least near the first end **5010** and near the second end **5012**. The variation in FIGS. **179-180** includes corrugations all the way around the circumference of the shield **5000**. The corrugations **5046** are vertically oriented folds that extend along the longitudinal axis. The folds form a plurality of peaks **5048** alternating with valleys **5050** around the circumference of the shield **5000**. The peaks **5048** project inwardly into the central lumen toward the longitudinal axis and the valleys **5050** are located between the peaks **5048**. The valleys **5050** project outwardly away from the longitudinal axis and away from the central lumen. The peaks **5048** and valleys **5050** are correspondingly shaped such that each peak **5048** is received or nested in an interlocking fashion within each valley **5050**. A peak **5048** is formed by a bend in the band. The corrugations **5046** are vertical folds or bellows that extend along the longitudinal axis. The corrugations **5046** facilitate reduction of the diametrical/lateral dimension of the shield **5000** by providing a plurality of hinge locations around the circumference. A peak **5048** at the inner surface **5002** forms a valley **5050** at the outer surface **5004**. The first end **5010** or second end **5012** is flexed inwardly and nested inside the other of the first end **5010** or second end **5012**. The shield **5000** is spiraled or curled into a smaller inner diameter. When the desired inner diameter is achieved, one or more peaks **5048** are nested within one or more valleys **5050** to create a locking configuration, as shown in FIG. **180**, in which the reduction and expansion of the lateral/diametrical dimension of the shield **5000** is fixed. One or more peaks **5048** at the inner surface **5002** at the second end **5012** are nested into tangential, circumferential abutment within one or more valleys **5050** at the outer surface **5004** of the first end **5010**. To release the lock, the one or more peaks **5048** are removed from abutment within the one or more valleys **5050**. In the unlocked configuration, the inner diameter may be reduced in sized so that it can be easily pulled out of the incision or body orifice. Of course, the shield **5000** may be readjusted to have an increased or decreased inner diameter and re-locked as desired.

Turning now to FIG. **181**, there is shown another variation of the shield **6000**. The shield **6000** is made of rigid material such as plastic or metal or other material. The shield **6000** includes a first end **6002** interconnected with a second end **6004** between an outer perimeter **6006** and an inner perimeter **6008**. Between the outer perimeter **6006** and the inner perimeter **6008**, the shield **6000** defines an inflection line that extends between the first end **6002** and the second end **6004**. The inflection line in FIG. **181** is a curve; however, the invention is not so limited. The shield **6000** includes a flange **6010** having an upper surface **6012** opposite from a lower surface **6014** defining a thickness therebetween. The flange **6010** is substantially planar and provides a cutting-board like surface for performing manual morcellation and protecting adjoining tissue. The flange **6010** is interconnected with a depending portion **6016**. The depending portion **6016** includes an inner surface **6018** that is contiguous with the upper surface **6012** of the flange **6010**. The depending portion **6016** includes an outer surface **6020** that is contiguous with the lower surface **6014** of the flange **6010**. The depending portion **6016** is curved. In one variation, the arc defined between the first end **6002** and the second end **6004** is less than or equal to approximately 180 degrees. In another variation, the arc defined between the first end **6002** and the second end **6004** is between approximately 45 degrees and 290 degrees. The shield **6000** is configured such that the depending portion **6016** is insertable into an incision or orifice or other body opening to partially circumferentially retract the tissue margin at the incision. The depending portion **6016** serves as a hook for securing the flange **6006** at the incision site and providing protection to the surrounding tissue. The shield **6000** is rigid and cut resistant such that the surgeon can safely morcellate against the flange **6012**. The shield **6000** of FIG. **181** can be used by itself and inserted directly into an incision/orifice or employed in combination with a retractor and/or containment bag of the like describe in this specification. A two ring retractor with webbing therebetween is inserted into the incision site or orifice and the tissue margin is retracted by rolling to top ring to wrap the webbing around the top ring as described herein. After the incision/orifice is retracted, the shield **6000** is placed inside the retractor to protect the surrounding tissue and the retractor webbing from inadvertent incision during a morcellation procedure. The flange **6010** is large enough to overlay the outer tissue such as the abdominal wall to provide a shelf/apron of protection for the patient. Although the depending portion **6016** is shown to be curved, the invention is not so limited and the depending portion may be flat or C-shaped. A C-shaped depending portion may assist in hooking the shield **6000** at the incision site. All of the methods described in this application for a guard and/or shield are interchangeable and applicable to all of the guards and shields described herein including but limited to their use with or without containment bags and/or retractors and/or other devices described herein or known to a person having ordinary skill in the art.

Turning now to FIGS. **182-189**, there is shown another variation of a shield **7000** adapted for placement within the vaginal canal. Although the shield **7000** is adapted for vaginal placement, it may also be adapted for placement into other orifices and/or incision sites by making variations in size and shape. The shield **7000** includes a guard portion **7002** connected to a batten **7004**.

Still referencing FIGS. **182-189**, the guard portion **7002** is substantially tubular in shape having an outer surface **7006** and an inner surface **7008** defining a lumen **7010**. The lumen **7010** may be any shape such as circular or oval. In one variation, the lumen **7010** transitions from an oval shape at the proximal end opening to a circular shape in the middle and an oval shape at the distal end opening. The inner surface **7008** conforms in shape to the outer surface **7006** defining a thickness therebetween. The guard portion **7002** is made of a flexible polymer that is cut-resistant. In another variation, the guard portion **7002** is rigid. The leading distal end includes a bead **7012** formed with the guard portion **7002**. The bead **7012** is located at the perimeter of the distal end opening. The bead **7012** has a curved surface and an increased thickness relative to a side section of the guard portion **7002**. The bead **7012** increases the dimension at the distal end forming a hook-like feature or a protruding discontinuity at the outer surface **7006**. In one variation, the bead **7012** is only formed with respect to the outer surface **7006** wherein the inner surface **7008** is smooth and without a discontinuity at the bead location. The guard portion **7002** also includes a proximal end opening. The guard portion **7002** defines a length of the shield **7000** between the proximal end opening and the distal end opening. The length of the shield **7000** is configured such that when the shield **7000** is placed inside the vagina, the bead **7012** advantageously extends just past the pubic bone and the bead **7012** engages the pubic bone of the patient to secure the shield **7000** with respect to the anatomy and prevent it from being pulled proximally out of the vagina. Therefore, the bead **7012** is larger or more prominent along the top of the guard portion **7002** where it would engage the pubic bone relative to the bottom of the guard portion **7002** at the distal end. In one variation, the bead **7012** may be uniform in size and shape all the way around the distal end opening. The shield **7000** need not anchor against the pubic bone and may contact the muscle wall of the vagina. In one variation, the proximal end opening does not include a bead and in another variation a proximal bead is provided to assist in anchoring the proximal end either to the anatomy or other device such as a retractor, containment bag or other access device such as a gel cap.

Turning now to FIG. **188**, the shape of the guard portion **7002** will now be described in greater detail. The guard portion **7002** is substantially shaped like an hourglass. In one variation, the hourglass shape includes an angled proximal opening and an angled distal opening as shown in FIG. **188**. In particular, the distal end opening is angled with respect to a horizontal plane at an angle **7016** and the proximal end opening is angled with respect to the horizontal plane at an angle **7018**. The horizontal plane **7014** being substantially perpendicular to the longitudinal axis **7020**. A lateral axis (not shown) extending into and out of the page is parallel to the planes containing the proximal and distal openings. In one variation, the angles **7016**, **7018** are substantially equal making the planes containing the proximal and distal openings substantially parallel to each other. In one variation, only the distal end is angled, meaning the plane containing the distal opening is angled with respect to the horizontal plane forming a less than 90-degree angle **7016** with the horizontal plane with the top end being forward-leaning such that it leads in an insertion orientation of the shield. The angled proximal end and distal end openings advantageously facilitate insertion of the shield **7000** into the vaginal orifice creating a lower insertion profile which will be described in greater detail with respect to FIGS. **189**A and **189**B. Still referencing FIG. **188**, the side section of the guard portion **7002** is curved about a longitudinal axis **7020** such that the outer surface **7006** of the side section is concave and the inner surface **7008** is conformingly convex. As can be seen in FIG. **188**, the side section is substantially hyperboloid in shape; however, the curves about the longitudinal axis **7020** in the cross-section shown need not be hyperbolas. The cross-section of the guard portion **7002** can generally be described as a C-shape that is revolved around the longitudinal axis **7020** to create the lumen **7010** and the tubular shape. FIG. **188** also illustrates the increased thickness of the bead **7012** relative to the thickness of the side section as well as the decreased thickness of the bead **7012** at the bottom relative to the top of the guard portion **7002**. Also, the bottom of the guard portion **7002** at the proximal end opening has a larger flange **7022** that advantageously serves to drape over and protect the female anatomy surrounding the vaginal opening. The shield **7000** in general and the guard portion **7002** in particular serve as a protective surface that guards a containment bag, retractor and vaginal canal tissue at the insertion location. The shield **7000** is made of hard, rigid, or semi-rigid, flexible, compliant, plastic or cut-resistant material or any material suitable according to one skilled in the art. The shield **7000** provides a protective surface guarding the surrounding tissue and containment bag and/or retractor against sharp objects such as scalpels, blades or morcellators and the like that are used to cut and reduce targeted tissue for extraction. The shield **7000** also provides an amount of retraction to maintain an effective working channel that remains open without collapsing.

The top of the guard portion **7002** includes a channel **7024** that is sized and configured to receive the batten **7004**. The channel **7024** is clearly visible in FIG. **187**. The channel **7024** includes a channel opening at the proximal end of the guard portion **7002** for receiving the batten **7004** and a closed distal end that is protected by the increased thickness of the bead **7012**. The channel **7024** is molded such that the batten **7004** may be inserted into and removed from the channel **7024**. For example, the batten **7004** may be inserted into the channel **7024** for the insertion of the shield **7000** and then removed when the shield is placed in the anatomy. In another variation, the guard portion **7002** is over molded onto the batten **7004** such that it is not removable. The batten **7004** may be secured with adhesive or other means such that the batten **7004** is not removable in another variation. The guard portion **7002** surrounding the channel **7024** is thicker relative to the side section providing reinforcement to the guard and protection to the anatomy from the relatively more rigid batten **7004**.

With particular reference to FIG. **187**A, the batten **7004** will now be described in greater detail. The batten **7004** is substantially L-shaped having a curved lower leg **7026** that conforms to the curvature of the channel **7024** and the curved side section of the guard portion **7002**. The upper leg **7028** is substantially straight and sized and configured to be easily grasped by a surgeon's hand for insertion purposes. The batten **7004** is made of a material that is relatively more rigid than the guard portion **7002** so as to impart the guard portion **7002** with rigidity and reinforcement properties that facilitate handling and insertion of the shield **7000** as well as securement of the shield **7000** to the anatomy. As such, the batten **7004** can be made of rigid polymer, plastic or metal. The side section of the guard portion **7002** has a softer durometer than the batten **7004** such that the batten **7004** serves to stiffen and reinforce the side section webbing to facilitate insertion of the shield **7000**. The lower and upper legs **7026**, **7028** of the batten **7004** have a width of approximately one inch. The lower leg **7026** is curved to have an outer surface that is concave along its length and an outer surface that is convex along its width. The lower leg **7026** is also curved to have an inner surface that is convex along its length and concave along its width so as to conform to the shape of the inner surface **7008** and outer surface **7006** of the guard portion **7002**. The batten **7004** may be located anywhere along the perimeter of the guard portion **7002**. For example, the batten **7004** with or without a channel **7024** may be located at the bottom of the guard portion **7002** such that the upper leg **7028** of the batten **7004** that serves as a handle portion angles downwardly toward the posterior side of the patient as morcellation would likely require protection porteriorly as shown in FIG. **1878**. In another variation, the batten **7004** is entirely omitted from the construction as shown in FIG. **187**C.

Turning now to FIGS. **189**A-**189**B, insertion of the shield **7000** into the vagina or other orifice/incision will now be described. The batten **7004** is inserted into the channel **7024** that is sized and configured to receive the lower leg **7026** in a friction-fit or other type of engagement. Once the lower leg **7026** is located inside the channel **7024**, the upper leg **7028** which is located at the proximal end of the guard portion extends radially away from the proximal end of the guard portion. As the batten **7004** is retained in the channel **7024**, the shield **7000** is grasped by its upper leg **7028** and angled with respect to the orifice such that the distal end of the lower leg **7026** of the batten **7004** and the rounded bead **7012** at the distal end leads the insertion and serves as the leading end **7030**. The movement of the shield **7000** is pendulum-like about the proximal end of the upper leg to create an arc-like pathway of insertion. The shape of the guard portion **7002** arising from the angled distal end opening creates a leading end **7030** that increases in size in the proximal direction in a wedge-like manner forming an acute angle illustrated by the V-shaped dashed lines **7032** in FIG. **189**A. In this way, a leading distal insertion angle is defined by a projection of the distal plane of the guard portion onto a plane perpendicular to the lateral axis of the guard portion. In addition, this wedge-like arrangement advantageously serves to retract tissue and facilitate insertion. The user advances the shield **7000** with the leading end **7030** retracting the tissue orifice along the way and then may rotate the shield **7000** upwardly to hook the leading end **7030** at the top portion of the bead **7012** under the pubic bone or other tissue to anchor the shield **7000** with respect to the anatomy. The user will manipulate the shield **7000** rotating the shield **7000** upwardly/anteriorly into position as can be seen in going from FIG. **189**A to FIG. **189**B.

Turning now to FIGS. **190**A-**190**C, the shield **7000**, with or without a batten **7004**, having a guard portion **7002** that is made of flexible material is manipulated for insertion by folding the guard portion **7002** into the lumen **7010** from an undeflected state shown in FIG. **190**A to a deflected state having a reduced size at the distal end as shown in FIG. **190**B. The bottom end of the shield **7000** is flexed upwardly in the direction shown by the arrow in FIG. **190**A. Fingers inserted inside the lumen **7010** of the shield **7000** can easily grasp the guard portion **7002** to scrunch the guard portion **7002** into a deflected configuration or fold the guard into a U-like shape having a reduced distal end suitable for insertion as shown in FIG. **190**C. Once in position, the fingers may release the guard portion **7002** and because of the flexible material of the guard portion **7002**, the guard portion **7002** will spring toward its undeflected state advantageously anchored inside the vagina. After releasing the guard portion, the fingers are removed from inside of the lumen. In another variation shown in FIG. **190**D, an introducer **7036** is employed to facilitate insertion of the shield **7000** into the orifice.

The shield **7000** may also be employed in combination with a retractor **724**. The retractor **724** is the same retractor **62** as described with respect to FIGS. **18-19**. The retractor **724** includes a first ring **726** and a second ring **728** interconnected by a flexible sidewall **730**. The sidewall **730** defines a central opening extending along the longitudinal axis of the retractor **724**. The second ring **728** can be compressed and inserted through the vaginal canal where it expands to create a securement against inside the vagina. The first ring **726** resides above the entrance to the vagina outside the patient where it can be rolled down to retract and enlarge the vaginal canal. The shield **7000** is inserted into the central opening of the retractor **724** following placement of the retractor **724**. The bead **7012** at the distal end of the shield **7000** is configured to connect to the second ring **728** of the retractor and the proximal end of the guard portion **7002** such as the flange **7022** is configured to connect to the first ring **726** to secure the shield **7000** to the retractor **724**. The proximal end and the distal end of the shield **7000** may snap under or over the first and second rings **726**, **728**, respectively. Alternatively, the retractor **724** may be provided with a channel **7024** and a batten **7004** inserted into the channel **7024** to help place and stiffen the retractor **724**. The batten **7004** may be removed to roll down the first ring **726** of the retractor **724** and then the batten **7004** may be reinserted into the channel **7024** or not.

In a hysterectomy, myomectomy or other procedure, the uterus is detached from the body via instruments inserted through the vagina or through one or more abdominal ports. After the uterus has been detached, the shield **7000** may be inserted directly into the vagina as described above employing the batten **7004** and manipulating the leading end **7030** to lead the insertion and anchoring the bead **7012** such as under the pubic bone or against the vagina. The proximal flange **7022** resides near the entrance to the vagina. The detached uterus would be gasped and pulled into the lumen **7010** of the shield **7000** against which it may be safely morcellated with a blade permitting the uterus to be cut into smaller pieces and completely removed through the vagina.

In another variation, a containment bag is placed inside the abdominal cavity either through an abdominal port or through the vaginal canal. The removed uterus is placed into the containment bag. The bag includes a tether and a proximal flexible ring. The tether of the containment bag is pulled through the vagina. The proximal ring of the containment bag is compressed into a low-profile configuration to facilitate pulling the proximal end of the containment bag through the vagina. The ring of the containment bag is pulled outside the body and allowed to expand into an open configuration, thereby, opening the mouth of the containment bag. The ring of the containment bag resides outside the entrance to the vagina. The ring of the containment bag may be rolled-down to roll the sidewall of the bag onto the ring of the containment bag. This action brings the removed uterus inside the bag closer to the vaginal opening. The shield **7000** is then inserted into the mouth of the containment bag and into the vaginal canal. The proximal flange **7022** resides at or near the entrance to the vagina. In one variation, the proximal flange **7022** of the shield **7000** is snapped under or over the ring of the containment bag. In such an embodiment, the proximal flange **7022** may include a bead-like reinforcement for snapping to the bag or other device such as a gel cap. The removed uterus is gasped with a grasper and pulled into the lumen **7010** of the shield **7000** where morcellation can commence.

The distal end of the shield **7000** is angled as described above which advantageously helps to move the detached uterus into the shield **7000**. The uterus is morcellated with a blade while it is at least partially resident within the shield **7000** before being completely removed in whole or in parts. The shield **7000** advantageously protects the surrounding tissues as well as the containment bag from the sharp blade helping to maintain the integrity of the containment bag and the closed morcellation system while expanding and increasing the space of the working channel.

In another variation, the same procedure is carried out as in the previous paragraph but a retractor **724** is inserted into the mouth of the containment bag after the uterus has been placed into the containment bag and after the ring of the containment bag is pulled to outside the body. The second ring **728** of the retractor **724** is compressed for easy insertion into the mouth of the containment bag and then allowed to expand into an open configuration inside the containment bag in a location distal to the vaginal canal inside the abdominal cavity. The first ring **726** of the retractor **724** that is resident outside the body is rolled about itself to roll the sidewall **720** of the retractor **724** onto the first ring **726**. This action retracts not only the vaginal canal but also retracts the containment bag out of the way clearing the vaginal canal for insertion of the shield **7000**. The containment bag is captured between the retractor and the vaginal canal keeping it in place and preventing its migration into or out of the vaginal canal. The shield **7000** is then inserted into the central lumen of the retractor **724** that is residing inside the containment bag. The shield **7000** may be attached to the retractor **724** or containment bag by snapping one or more of the proximal end and distal end to first ring **726** or second ring **728** of the retractor **724** or ring of the containment bag. The uterus can then be grasped with a surgical instrument and pulled from the unprotected pouch of the containment bag into the central lumen **7010** of the shield **7000** where the uterus is morcellated with a blade while it is at least partially resident within the shield **7000** before being completely removed in whole or in parts. The shield **7000** advantageously protects the surrounding vaginal canal as well as the containment bag and retractor from the sharp blade helping to maintain the integrity of the containment bag and the closed morcellation system while providing the surgeon with a mechanism to perform morcellation safely and quickly.

In another variation, the same procedure is carried out in the same way as in the previous paragraph except that the retractor **724** is placed into the vaginal canal before the containment bag and the specimen inside is pulled through the vaginal canal. In this variation, the removed uterus is placed inside the containment bag located inside the abdominal cavity and the tether attached to the proximal end of the containment bag is pulled with a grasper through the central lumen of the retractor bringing the proximal ring and mouth of the containment bag to the outside of the patient. The ring of the containment bag may then be rolled down to bring the detached uterus closer to the opening. Afterwards, the shield **7000** is inserted. It retracts the containment bag creating a working channel though the central lumen **7010** of the shield **7000** for moving and morcellating the detached uterus. The proximal flange **7022** of the shield **7000** may be snapped under the ring of the containment bag or the proximal first ring **726** of the retractor **724**. The containment bag is captured between the retractor **724** and the shield **7000** keeping it from slipping proximally or distally during the procedure. The flange **7022** of the shield **7000** may also serve as a cut-resistant surface protecting against sharp blades used to cut the uterus for removal. For all of the above procedures, the containment bag and retractor combination of FIG. **20** may be used in lieu of one or more of the containment bag and retractor **724**.

It is understood that various modifications may be made to the embodiments disclosed herein. Therefore, the above description should not be construed as limiting, but merely as exemplifications of preferred embodiments. Those skilled in the art will envision other modifications within the scope and spirit of the present disclosure.

We claim:

1. A method comprising steps of:

providing a surgical shield configured for insertion into and protection of an orifice of a patient; the surgical shield having a guard portion that is made of flexible material; the guard portion being generally tubular in shape defining a lumen extending along a longitudinal axis between a proximal opening at a proximal end and a distal opening at a distal end; the surgical shield further includes a batten removably connected to the guard portion; the batten being relatively more rigid than the guard portion and having a reinforcing portion connected to a handle portion; the reinforcing portion extending along the longitudinal axis of the guard portion; the handle portion being located at the proximal end of the guard portion and extending away from the proximal end of the guard portion;

connecting the batten to the guard portion for insertion of the surgical shield; and

grasping the handle portion of the batten and angling the surgical shield relative to the orifice of the patient such that a distal end of the reinforcing portion at the distal end of the guard portion leads the insertion and serves as a leading end.

2. The method of claim **1** wherein the step of connecting the batten to the guard portion comprises a step of inserting the reinforcing portion of the batten into a channel of the guard portion.

3. The method of claim **1** further including a step of removing the batten while the surgical shield is located within the orifice.

4. A method comprising steps of:

providing a surgical shield configured for insertion into and protection of an orifice of a patient the surgical shield having a guard portion that has an enlarged state and a reduced state; wherein the guard portion is made of flexible material that is biased to return to the enlarged state; the guard portion being generally tubular in shape defining a lumen extending along a longitudinal axis between a proximal opening at a proximal end and a distal opening at a distal end;

arranging the guard portion into the reduced state for insertion of the surgical shield;

and

releasing the surgical shield from the reduced state such that it expands toward the enlarged state against the orifice,

wherein the step of arranging the guard portion into the reduced state comprises steps of:

grasping the guard portion by inserting fingers inside the lumen; and

folding the guard portion into the lumen from an undeflected state to a deflected state having a reduced sized at the distal end.

5. The method of claim **4** wherein the surgical shield further includes a batten having a reinforcing portion connected to a handle portion; the reinforcing portion being connected to the guard portion and extending along the longitudinal axis of the guard portion; the handle portion being located at the proximal end of the guard portion and extending radially away from the proximal end of the guard portion.

6. The method of claim **1** further comprises a step of creating a pathway of insertion by moving the surgical shield in a pendulum motion about the proximal end of the handle portion of the batten; the pathway of insertion having an arc-shaped.

7. The method of claim **1** wherein a leading distal insertion angle is defined by a projection of a distal plane containing the distal opening and a plane perpendicular to a lateral axis of the guard portion.

8. The method of claim **4** wherein when in the deflected state a bottom end of the surgical shield is flexed upwardly so as to fold the guard portion into a U-shaped having a reduced distal end.

9. The method of claim **4** wherein the step of releasing the surgical shield from the reduced state comprises releasing the guard portion and removing the fingers from inside the lumen.

10. The method of claim **4** further comprising a step of providing a retractor having a first ring and a second ring interconnected by a flexible sidewall defining a central lumen having a top opening and a bottom opening, wherein the surgical shield is configured for placement into the central lumen of the retractor by connecting the proximal and distal ends of the guard portion to the first and second rings of the retractor, respectively.

11. The method of claim **4** further comprising a step of providing a containment bag having an interior and a bag opening for accessing the interior of the containment bag; the containment bag being configured to isolate and contain a tissue specimen, wherein the surgical shield is configured for placement into the bag opening following placement of the tissue specimen inside the containment bag within the orifice.

12. The method of claim **1** wherein the guard portion includes a bead having an enlarged thickness around the distal opening, and wherein the distal end of the reinforcing portion and the bead at the distal end form the leading end for insertion of the surgical shield.

13. The method of claim **11** further comprising a step of providing a retractor having a first ring and a second ring interconnected by a flexible sidewall defining a central lumen having a top opening and a bottom opening, wherein the retractor is configured for placement into the bag opening following placement of the tissue specimen inside the containment bag within the orifice and prior to placement of the surgical shield.

14. The method of claim **10** further comprising a step of providing a containment bag having an interior and a bag opening for accessing the interior of the containment bag; the containment bag being configured to isolate and contain a tissue specimen, wherein the containment bag is configured for placement into the central lumen of the retractor following placement of the tissue specimen inside the containment bag within the orifice and prior to placement of the surgical shield into the bag opening.

15. The method of claim **2** wherein the channel includes an opening at the proximal end of the guard portion; the opening being sized and configured to receive the reinforcing portion; wherein the reinforcing portion of the batten is located inside the channel.

16. The method of claim **2** wherein the guard portion comprises an outer surface and an inner surface defining a thickness therebetween, and wherein the channel is defined between the outer surface and inner surface of the guard portion.

17. The method of claim **1** further comprising a step of providing a retractor having a first ring and a second ring interconnected by a flexible sidewall defining a central lumen having a top opening and a bottom opening, wherein the surgical shield is configured for placement into the central lumen of the retractor by connecting the proximal and distal ends of the guard portion to the first and second rings of the retractor, respectively.

18. The method of claim **1** further comprising a step of providing a containment bag having an interior and a bag opening for accessing the interior of the containment bag; the containment bag being configured to isolate and contain a tissue specimen, wherein the containment bag is configured for placement into the central lumen of the retractor following placement of the tissue specimen inside the containment bag within the orifice and prior to placement of the surgical shield into the bag opening.

19. The method of claim **1** further comprising a step of providing a containment bag having an interior and a bag opening for accessing the interior of the containment bag; the containment bag being configured to isolate and contain a tissue specimen, wherein the surgical shield is configured for placement into the bag opening following placement of the tissue specimen inside the containment bag within the orifice.

20. The method of claim **19** further comprising a step of providing a retractor having a first ring and a second ring interconnected by a flexible sidewall defining a central lumen having a top opening and a bottom opening, wherein the retractor is configured for placement into the bag opening following placement of the tissue specimen inside the containment bag within the orifice and prior to placement of the surgical shield.

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